mc-9
Operator's Manual

TMC MCI

TRANSPORTATION MANUFACTURING CORPORATION

ROSWELL, NEW MEXICO, U.S.A. 88202-5670
MANUFACTURERS OF INTERCITY COACHES, TRANSIT BUSES & ROBOTIC TRAILERS

MOTOR COACH INDUSTRIES INC.

PEMBINA, NORTH DAKOTA, U.S.A. 58271-0349

MOTOR COACH INDUSTRIES LTD.

WINNIPEG, MANITOBA, CANADA R3G 0J8
MANUFACTURERS OF INTERCITY COACHES

Custom Coach™

CUSTOM COACH

COLUMBUS, OHIO, U.S.A. 43215-1088
COACH AND BUS CUSTOMIZATION

To The Driver

This manual has been prepared to give you the necessary information to successfully operate the Model MC-9 Intercity Coach. It is not the intention of this manual to instruct operators.

To obtain the most satisfactory coach performance and assure your passengers maximum safety and comfort, complete knowledge of your coach and correct operating practises are important.

The specifications and information throughout this manual are up to date at the time of publications and will be useful in normal operation or when emergencies or abnormal conditions occur. Any malfunction which interferes with satisfactory operation of the coach should be reported to responsible service personnel for immediate attention, particularly if safety may be affected.

This manual is subject to change without notice.

Driving Controls

All hand and foot controls used in the normal operation of the coach, and all gauges, tell-tale lights and switches are located in the driver's compartment. They are so arranged as to be conveniently reached by you while in the driver's seat.

These, as well as other controls and equipment which you may need to use under abnormal or emergency conditions, are described and illustrated throughout this manual.

Information is included concerning minor service and maintenance procedures with which you should be familiar.

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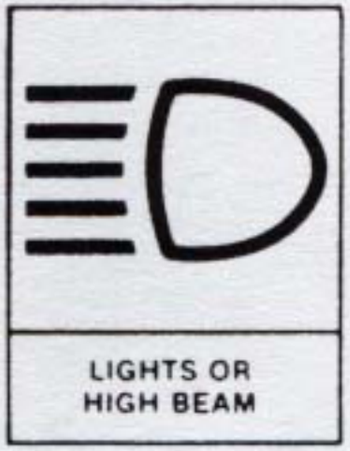
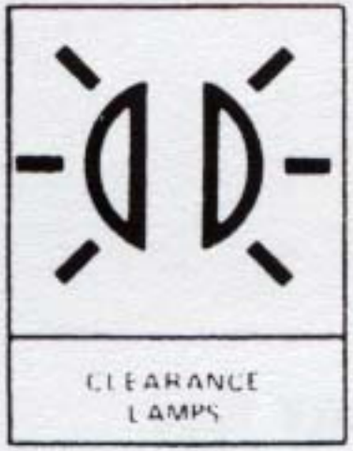
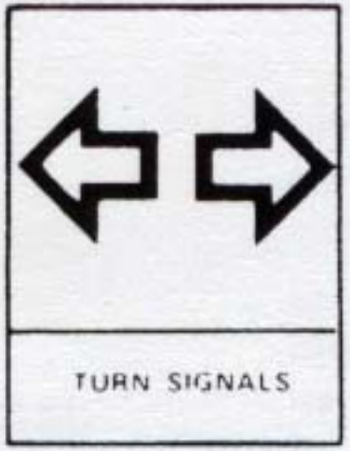
This publication is effective for all 1987-1989 MC-9 Coaches.

INTERNATIONAL SYMBOLS

Some of the following international symbols are used to identify the controls and displays on these coaches.

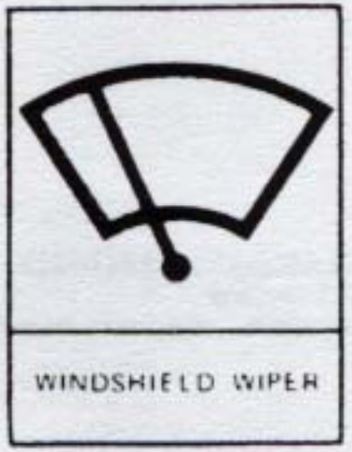

LIGHTS OR HIGH BEAM


CLEARANCE LAMPS

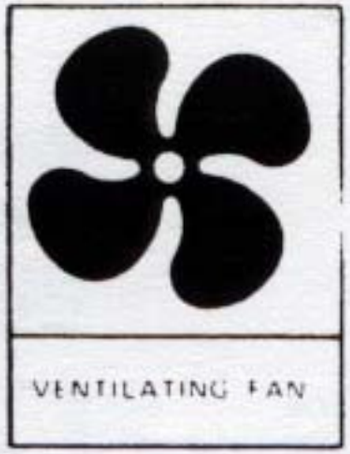

TURN SIGNALS

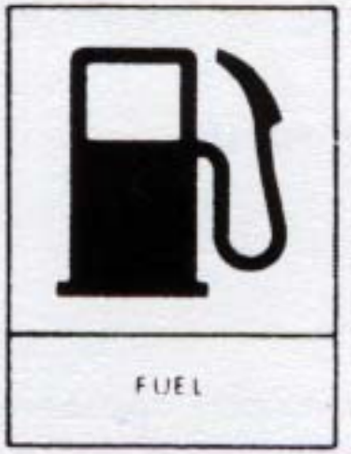
HAZARD WARNING FLASHER

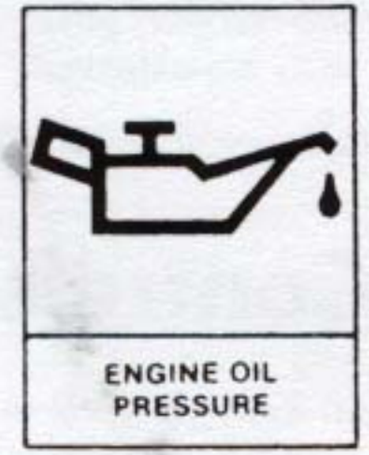
WINDSHIELD WASHER

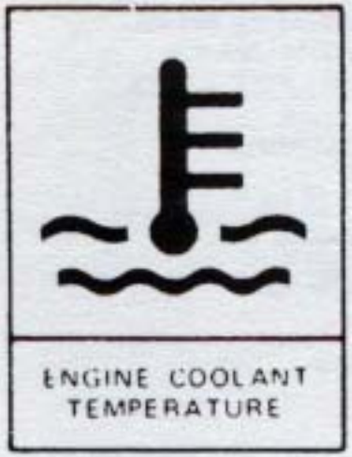

WINDSHIELD WIPER

WINDSHIELD DEFROSTER


VENTILATING FAN

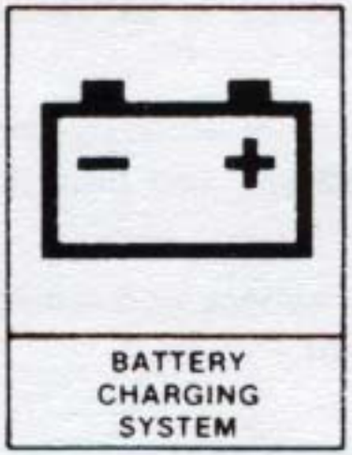

FUEL


ENGINE OIL PRESSURE


ENGINE COOLANT TEMPERATURE

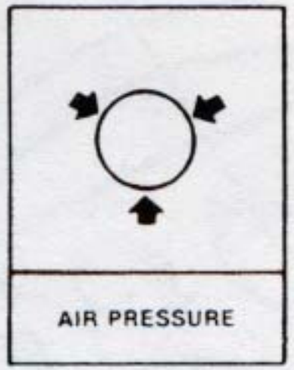
ENGINE OIL TEMPERATURE

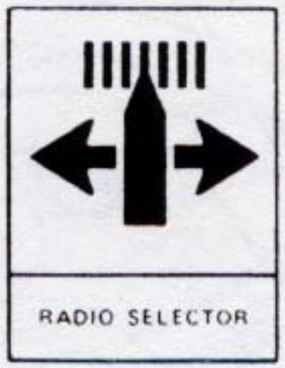
FASTEN SEAT BELTS


BATTERY CHARGING SYSTEM

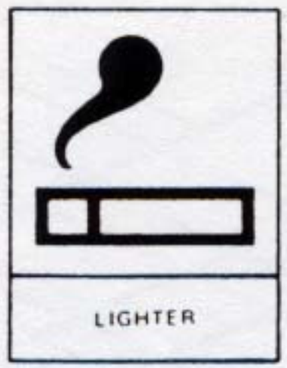
HORN

Symbol Chart (Cont'd)


AIR PRESSURE


RADIO SELECTOR

RADIO VOLUME


LIGHTER

CAUTION
POSSIBLE INJURY

SPARK OR FLAME
COULD
EXPLODE BATTERY

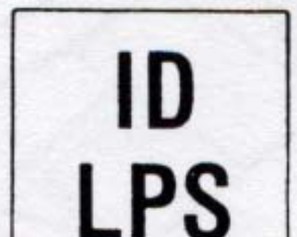
AVOID SPARKS
OR FLAMES

CAUSTIC
BATTERY ACID
COULD CAUSE BURNS

PROTECT EYES
BY SHIELDING

ILLUMINATION
CONTROL

ENGINE COOLANT
LEVEL



IDENTIFICATION
LAMPS

SPEAKER

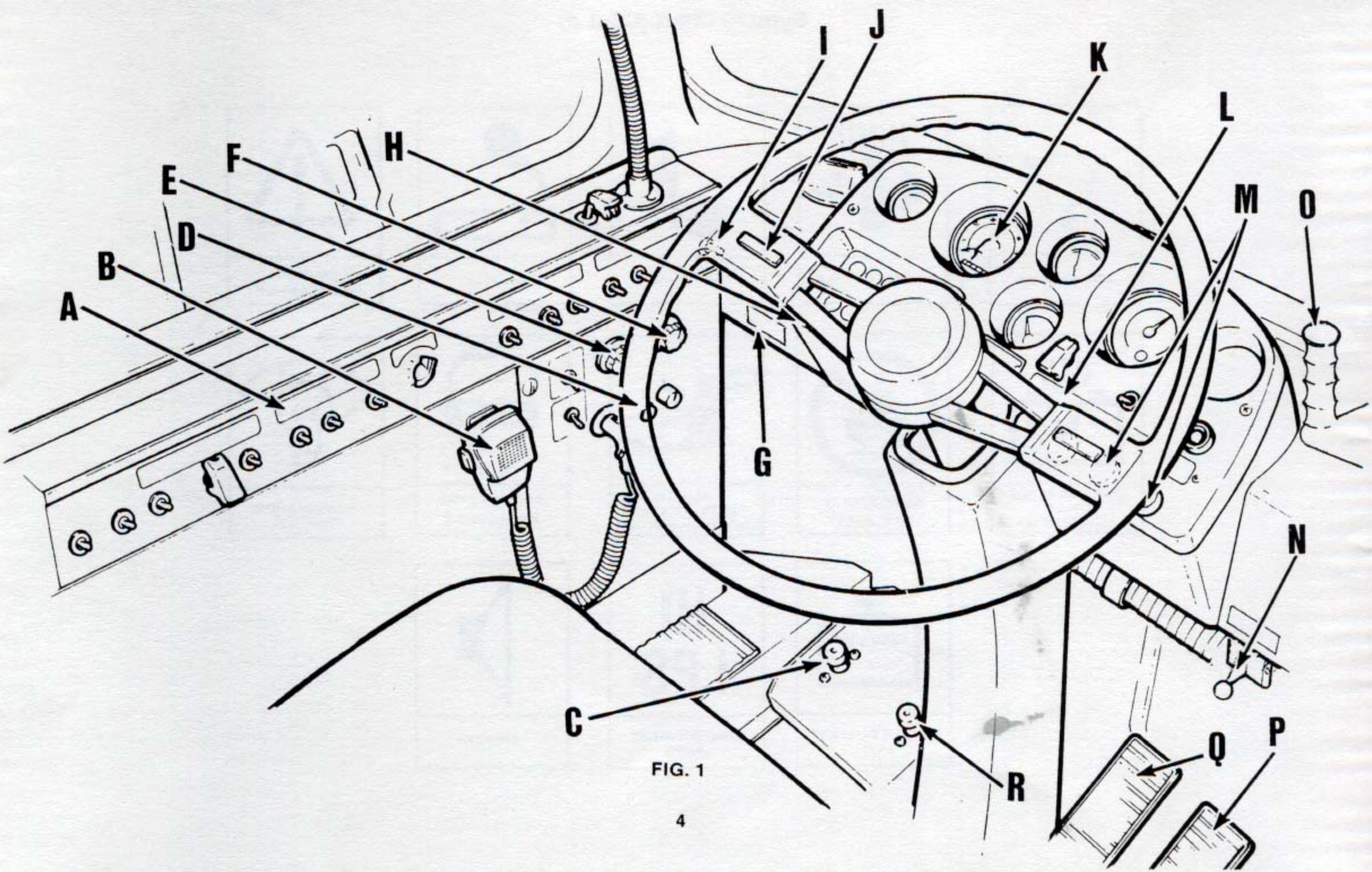


FIG. 1

Operator's Compartment

A. **SWITCH PANEL** ..... See Page 10.

*B. **P.A. SYSTEM/ MICROPHONE** ..... Used to address passengers.

C. **HEADLIGHT DIMMER SWITCH** ..... Selects headlights high or low beam.

*D. **P.A. SYSTEM VOLUME CONTROL** ..... Adjusts P.A. System.

E. **ILLUMINATION CONTROL** .. Controls instrument & switch panel legend lights.

F. **DASH LIGHT CONTROL** .... Controls instrument panel gauge lights.

G. **DRIVER'S HEATER AIR CONTROL** ..... Selects fresh or recirculated air into driver's heater/defroster system.

H. **DIRECTIONAL SIGNAL SWITCH LEVER** ..... Used to signal turns.

I. **SLOTTED FASTENERS KEY** .. Opens all compartments closed with slotted fasteners.

J. **HORN BUTTON** ..... Sounds electric horn.

K. **INSTRUMENT PANEL** ..... See Page 8.

L. **WINDSHIELD WASHER CONTROL** ..... Operates windshield washers.

M. **WINDSHIELD WIPER CONTROLS** ..... Controls windshield wiper motors.

N. **ENTRANCE DOOR LOCK OVERRULE SWITCH** .... Releases door air lock if it fails to do so when door control handle is operated.

O. **ENTRANCE DOOR CONTROL HANDLE** .... Opens and closes Sedan Type Entrance Door.

*P. **ACCELERATOR PEDAL** ..... Controls engine speed.

Q. **BRAKE PEDAL** ..... Applies service and emergency brakes.

*R. **FOGLIGHT SWITCH** ..... Controls foglights.

TURN LIGHT FLASHER (NOT SHOWN) ..... Operates turn signal lights.

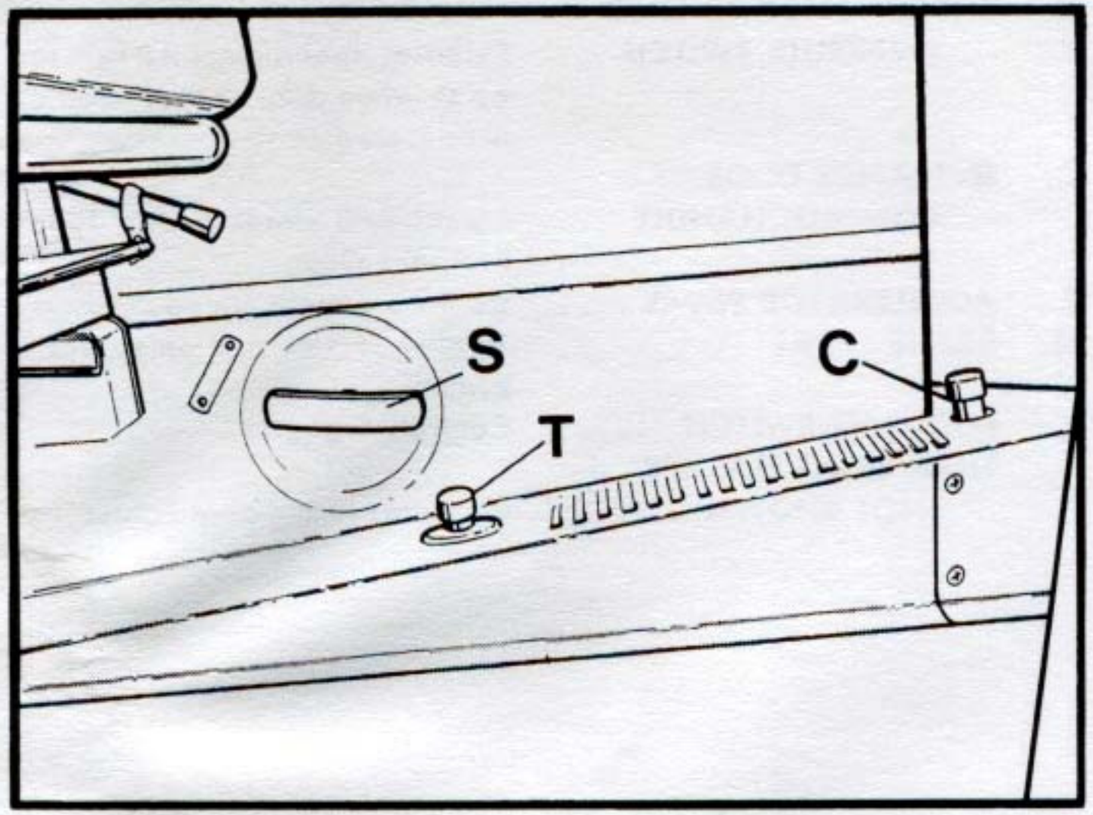


FIG. 2

S. **DRIVER'S HEATER WATER VALVE** . . . . . Controls water flow to driver's heater and defroster.

T. **HORN SWITCH (FLOOR)** . . . Sounds electric or optional air horn.

U. **GEAR OR RANGE SELECTOR** . . . . . Selects transmission gear or range.

V. **CLUTCH PEDAL** . . . . . Engages and disengages clutch with standard transmissions only.

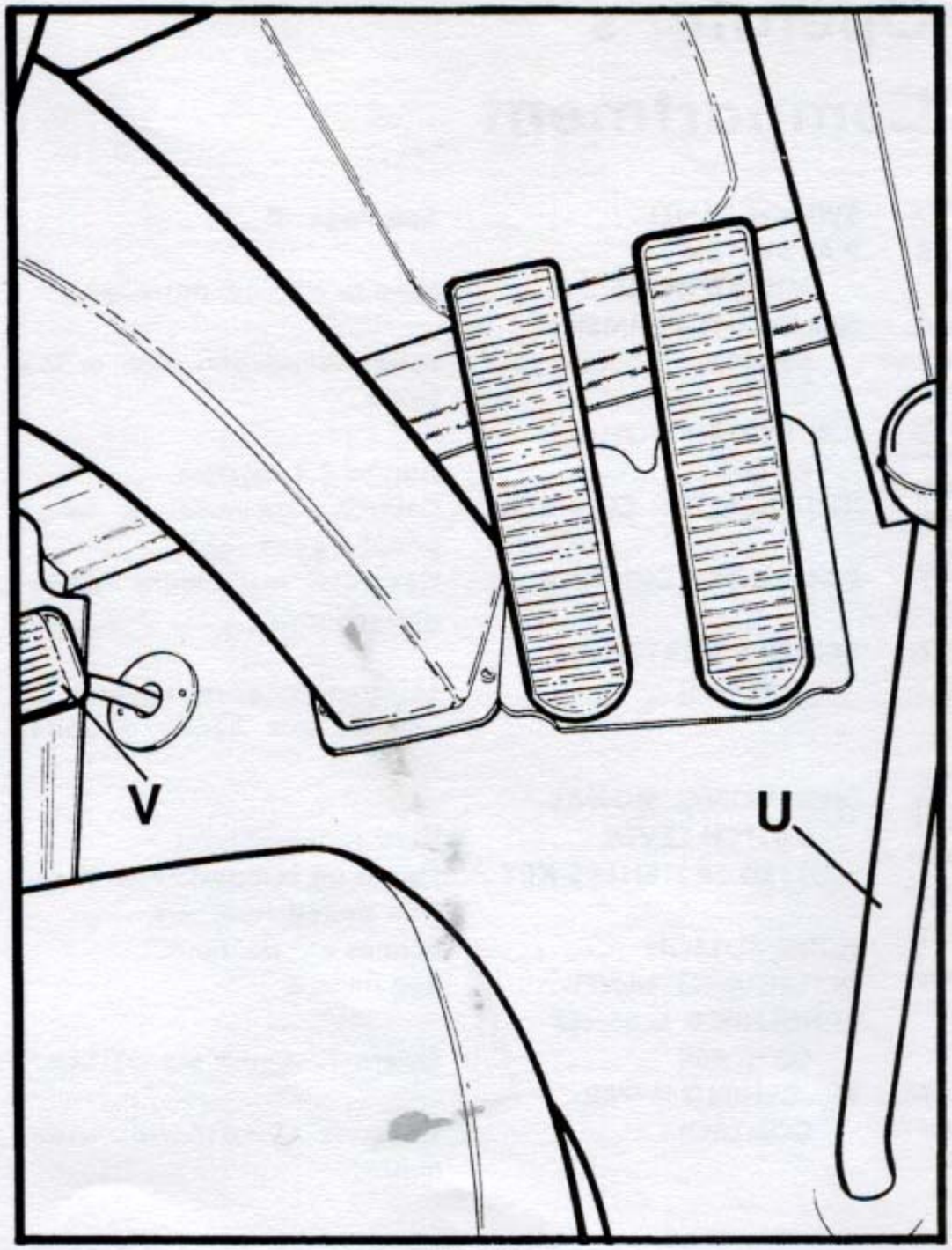


FIG. 3

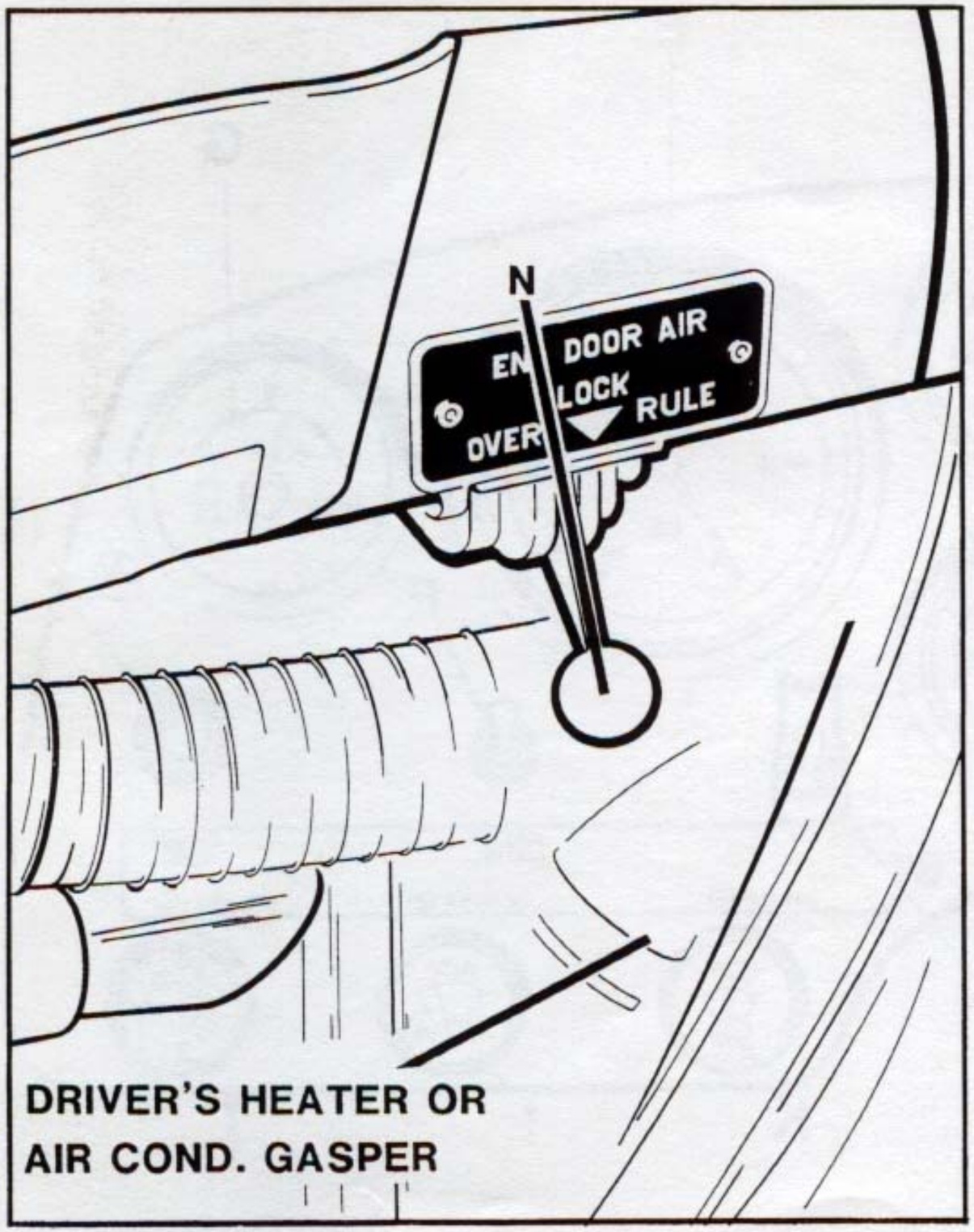


FIG. 4

DRIVER'S FRESH AIR GASPER ..... Controls fresh air into driver's compartment.

DRIVER'S HEATER OR AIR COND. GASPER ..... Controls selected heated or cooled air into lower driver's compartment area.

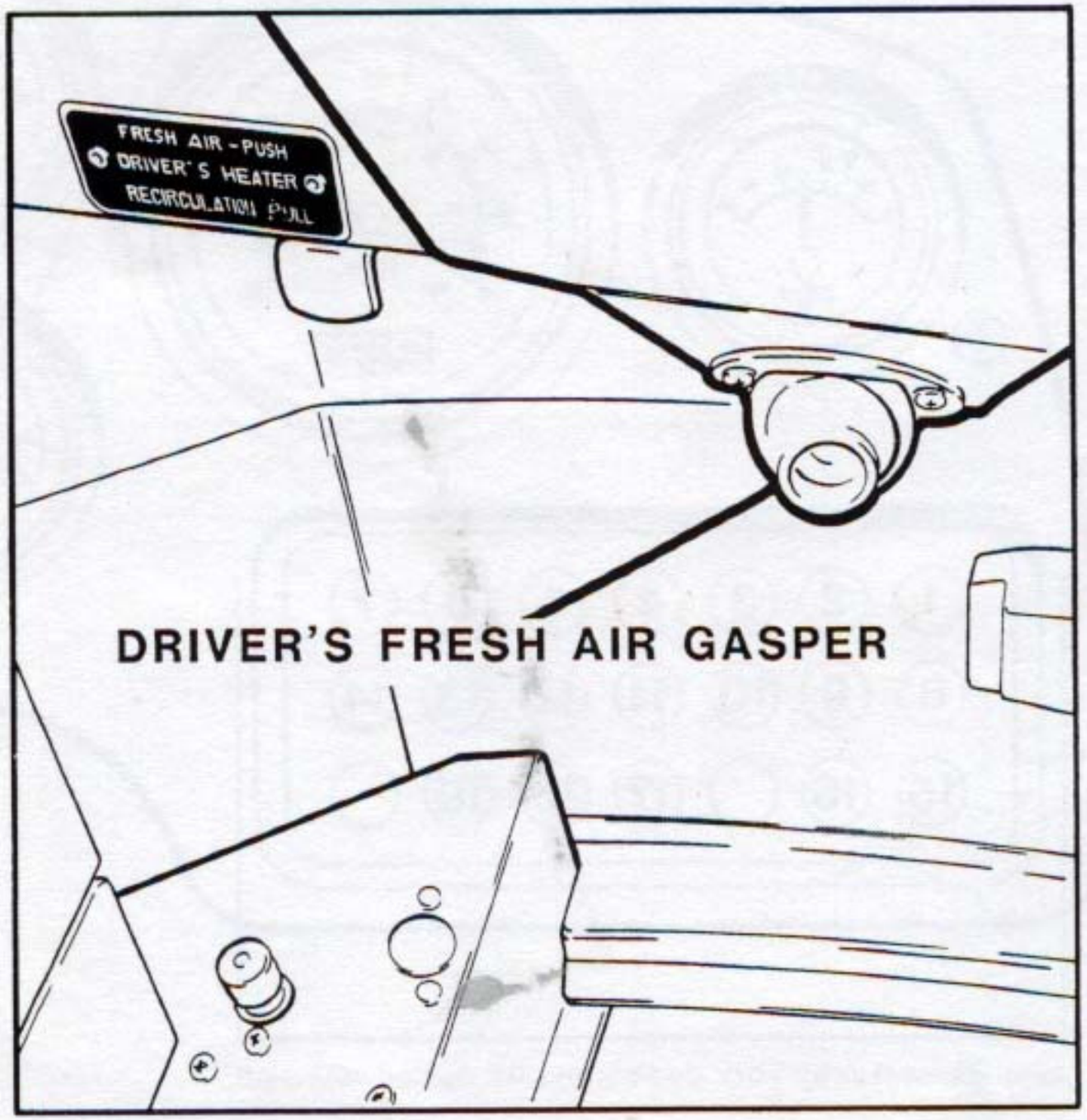


FIG. 5

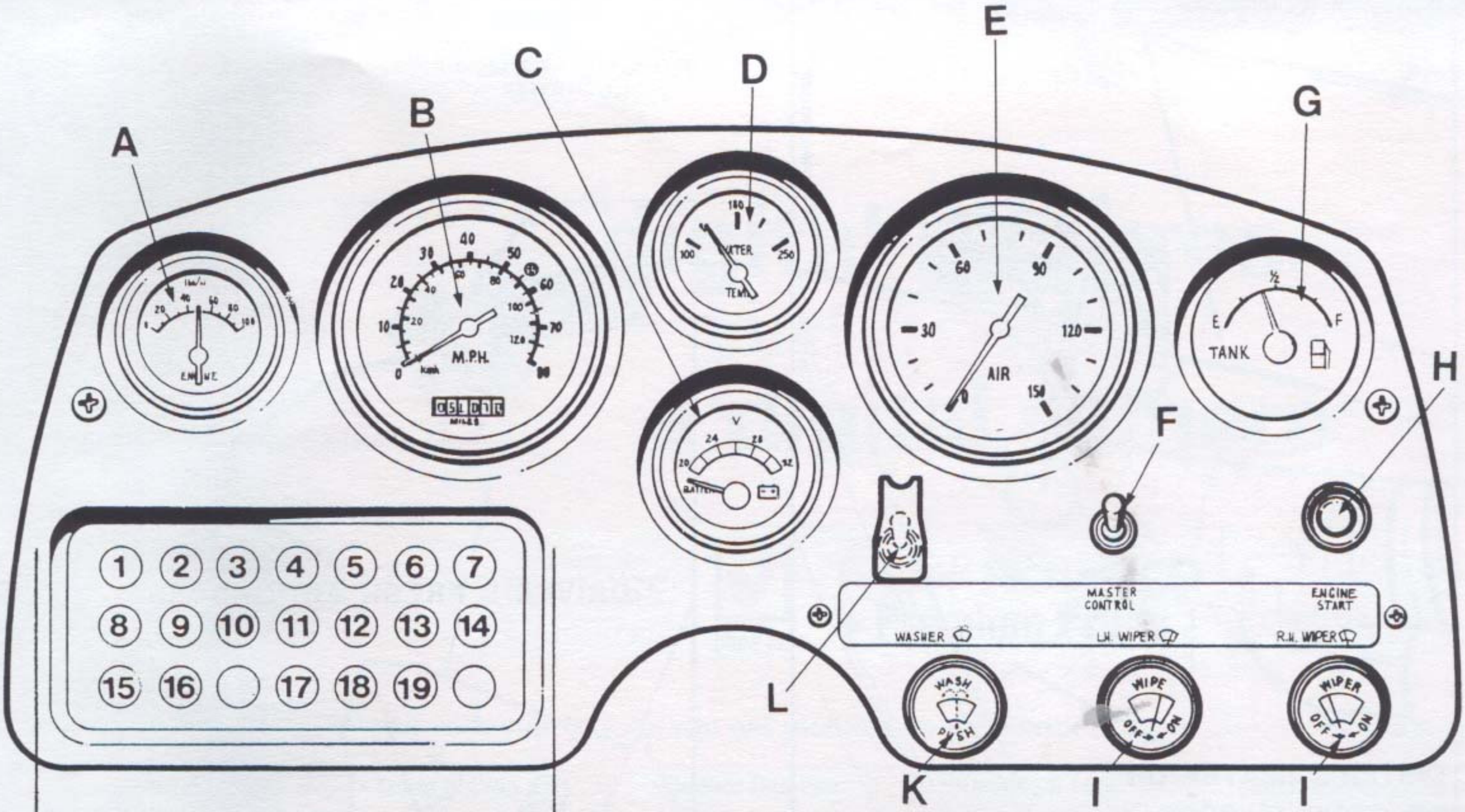


FIG. 6

Arrangement may vary depending on option selection.

Instrument Panel

A.	**OIL PRESSURE GAUGE**	Indicates oil pressure.
B.	**SPEEDOMETER**	Indicates vehicle speed.
*C.	**VOLT METER**	Measures system voltage.
D.	**WATER TEMP. GAUGE**	Indicates engine temperature.
E.	**AIR PRESSURE GAUGE**	Indicates coach air system pressure.
F.	**"MASTER CONTROL" SWITCH**	Allows operation of engine and accessories when in "ON" position. Stops engine in "OFF" position.
*	**MASTER CONTROL, STARTER AND ENGINE OVERRULE (Keyed) (NOT SHOWN)** .	Activates circuit to engine and accessories. Engages starter. Overrules automatic engine shutdown when held in start position.
*G.	**FUEL GAUGE**	Indicates amount of fule in tank.
H.	**STARTER BUTTON & ENGINE OVERRULE**	Engages starter. Overrules automatic engine shutdown when held in start position.
I.	**WINDSHIELD WIPER CONTROLS**	Controls windshield wiper motors.
K.	**WINDSHIELD WASHER CONTROL**	Operates windshield washers.
L.	**"EMERG. STOP" SWITCH** .. Non-Turbo Only	Stops engine if master control switch in "OFF" position fails to do so.

Alarm System

The coach is equipped with an alarm system of "TELL-TALE" lamps and in some cases a buzzer signal which immediately warns the driver of any abnormal operating conditions. The "TELL-TALE" lamps are located on the instrument panel in front of the driver.

1.	**HEADLIGHT HI-BEAM TELL-TALE**	Glows when headlight hi-beams are on.
2.	**"HOT ENG." TELL-TALE**	Flashes and buzzes when engine overheated.
3.	**"LOW OIL" TELL-TALE**	Flashes and buzzes when oil pressure too low.
*4.	**"LOW WATER" TELL-TALE** ..	Flashes and buzzer operates when water level too low.
5.	**"LOW AIR" TELL-TALE**	Flashes and buzzes when coach air pressure too low.
6.	**TRAILING AXLE BELLOWS LOW AIR TELL-TALE**	Glows when air pressure low in trailing axle bellows.
7.	**"EMERG. BRAKE" TELL-TALE**	Flashes when emergency brakes are applied.
8.	**"A/C HI-LO" TELL-TALE** ...	Glows when air conditioning system malfunctions.
9.	**"TURN LIGHT" TELL-TALE** ..	Flashes when turn signals are on.
10.	**"HAZARD WARNING" TELL-TALE**	Flashes when hazard warning is operated.

*Optional

*11. **"LOW FUEL" TELL-TALE** .... Glows when fuel supply is low
Fuel remaining approx.
20 Gal. Imp., 25 Gal. U.S., 95L (W/O aux. tank)
25 Gal. Imp., 30 Gal U.S., 114L (W/aux. tank)

12. **"B.U. LITE" TELL-TALE** ..... Flashes when back-up lights are on.

13. **"NOT. GEN." TELL-TALE** ... Glows when generator not charging.

*14. **"LAV. EMERG." TELL-TALE** . Glows and buzzes if emergency button in lavatory is pressed.

15. **"HEAT ON" TELL-TALE** .... Glows when heating system operating.

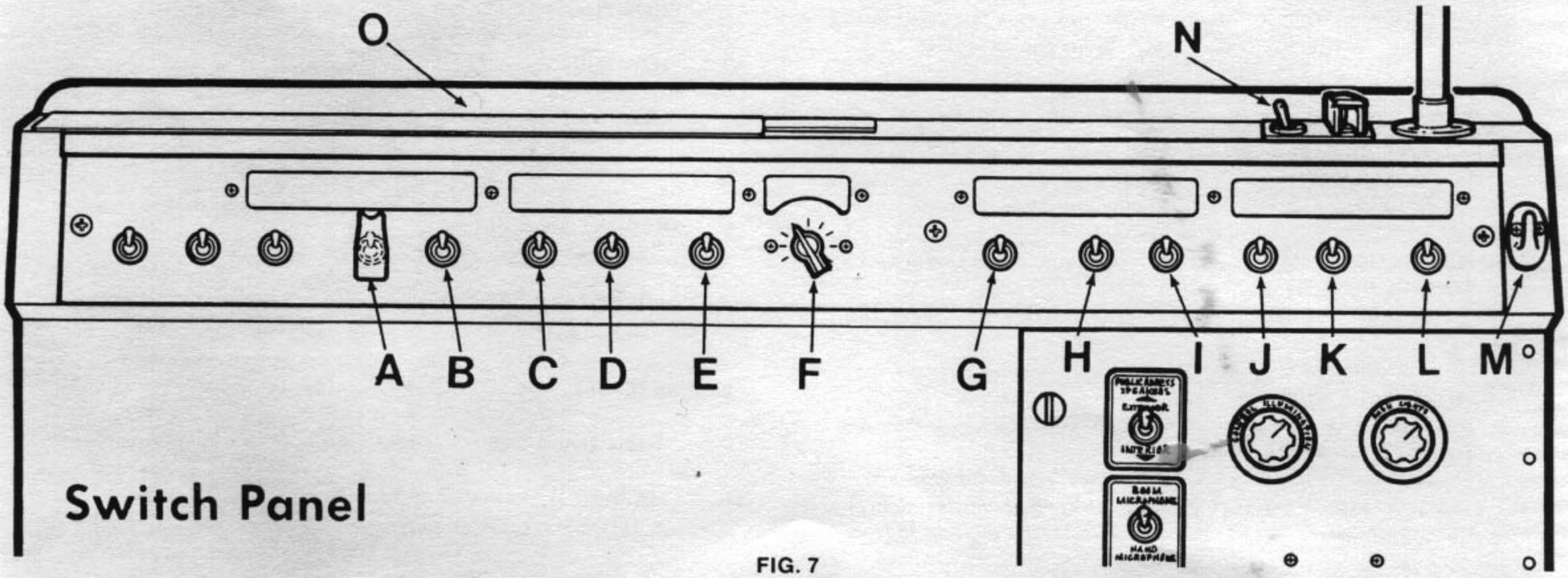
*16. **"STOP LIGHT" TELL-TALE** .. Glows when stoplights are activated.

*17. **"STEP OUT"** ..... Glows when retractable step is extended.

*18. **"FIRE ALARM" TELL-TALE** .. Glows and operates buzzer to warn of over-heated condition in engine compartment.

19. **"FOGLIGHT" TELL-TALE** .... Glows when switched on.

*Optional



Switch Panel

FIG. 7

Switch Panel

*A. **TRAILING AXLE UNLOADING SWITCH** .. When engaged unloads air pressure from trailing axle bellows.

B. **FAST IDLE** ..... Engages engine fast idle.

C. **DRIVER'S AIR CONDITIONING** ..... Control driver's air conditioning system.

D. **DRIVER'S HEATER/ DEFROSTER FAN SWITCH** Controls driver's heater and defroster fans.

E. **PASSENGER AIR COND./ HEATING**..... Controls air conditioning and heating system.

F. **COACH HEAT CONTROL** ... Controls interior temperature.

G. **STEPLIGHT AND CHIME** ... Illuminates steplight and allows use of passenger chime.

H. **INDIRECT LIGHTS** ..... Controls interior indirect lights.

I. **DRIVER'S LIGHT** ..... Controls light above driver's compartment.

J. **CLEARANCE AND IDENTIFICATION LAMPS** ..... Controls exterior clearance, identification, license, tail and destination sign lights. Also interior aisle and running lights. Allows passengers to turn on prefocused reading light.

K. **HEADLAMPS** ..... Controls headlights.

L. **"HAZARD" SWITCH** ..... Activates flasher for all front and rear turn signal lamps.

*M. **LAVATORY DOOR KEY** .... Locks or unlocks lavatory door.

*N. **"STEP IN-OUT"** ..... Activates retractable entrance step.

O. **AIR DEFLECTOR** ..... Directs air flow to driver's window.

(NOT SHOWN)

ILLUMINATION CONTROL .. Controls instrument and switch panel legend lights.

DASH LIGHT CONTROL .... Controls instrument panel gauge lights.

* **MIRROR HEAT** ..... Activates heating element in Rear View Mirror.

* **"ENTRANCE DOOR"** ..... Opens or closes Bi-Part entrance door.

* **"JACOB'S BRAKE**..... Activates full or half engine brake.

* **PASSENGER AUX. A/C** .... Auxiliary air conditioning.

SOLENOID SHIFT REVERSE . Engages reverse solenoid for shift into reverse gear with 4-speed standard transmission only.

* **PRESSURIZED ETHER START SYSTEM** ..... Aids engine starting in extremely cold weather.

*** Optional**

Emergency Conditions

IMPORTANT

Gauges and tell-tale lamps are provided so that the operator can observe the operation and condition of various components and equipment. If abnormal conditions are indicated, TAKE ACTION AT ONCE to locate and correct the cause before serious damage can occur. DO NOT IGNORE warnings of abnormal operating conditions. During operation, regularly check all gauges and tell-tale lamps.

Engine Alarm System

The engine is equipped with an alarm system to warn the operator of abnormal conditions. Such conditions are indicated by tell-tale lights on the instrument panel as well as a buzzer or beeper in the front junction box (See "Alarm System" earlier in this manual for a complete listing.) Some coaches have an automatic shutdown system interconnected with the engine alarm system to shut off the engine in case of oil pressure drop, abnormal temperature rise, or low coolant level. This feature prevents damage to the coach engine if any of these abnormal conditions arise.

The action of the automatic shutdown controls can be overruled in order to move the coach to a safe location by use of the "STARTER-OVERRULE SWITCH" on the driver's instrument panel. If engine is shut off automatically, turn "MASTER" switch to "OFF" position momentarily and switch on again. Depress "STARTER-OVERRULE SWITCH" or, if key switch, hold in start position to start coach, and hold after engine is started in order to move coach to a safe location.

Under no circumstances should the engine be operated longer than absolutely necessary after the engine has been stopped by automatic shutdown controls.

Engine Oil Pressure

Engine oil pressure gauge is mounted on instrument panel in front of operator. Normal readings at operating temperature are 50-70 P.S.I. (345-483 kPa) at 1800 R.P.M.

If during operation the engine oil pressure drops below a safe level, the "LOW OIL" tell-tale light on the driver's instrument panel will go on, and the warning buzzer will sound. If the coach is equipped with automatic shut-off controls, these controls will stop the engine. The automatic shut-off system can be overruled to move the coach to safety. See "ENGINE ALARM SYSTEM."

Engine Temperature

A gauge marked "WATER TEMP." is located on the instrument panel to indicate engine temperature. The most efficient engine temperature range is 170°-195° F (77°-91° C). If possible, avoid going to full throttle until engine coolant temperature reaches 140° F (60° C). The engine will come up to normal operating temperature shortly after you start driving.

If engine becomes overheated during operation, the alarm buzzer will sound and the "HOT ENG." tell-tale will flash. If coach is equipped with automatic shut-off system, the safety control relay will stop the engine. The automatic shut-off system can be overruled if necessary to move the coach to safety as outlined under "ENGINE ALARM SYSTEM." IF OVERHEATING TAKES PLACE, CHECK WATER LEVEL OF ENGINE COOLING SYSTEM AS DIRECTED UNDER "ENGINE COOLING SYSTEM" and for other possible causes.

Air Pressure

The brakes, air suspension system and other systems and controls of the coach depend on adequate air pressure for their operation. Air pressure in the coach air system is therefore extremely important.

When the "MASTER" switch is in the "ON" position the "LOW AIR" tell-tale lamp will flash and buzzer will sound if air pressure is below 70-75 psi (483-517 kPa) and remain on until air pressure reaches 100 psi (690 kPa).

If, during normal operation, the "LOW AIR" tell-tale light flashes and buzzer sounds it will indicate that air pressure is too low, stop the vehicle at once and determine reason for pressure loss.

Air System Emergency Fill

If coach air system pressure is low and it is impossible to operate engine, system may be filled from an external air source by attaching an air line to the "ping" tank located at the right rear of the engine compartment and accessible when the right-hand engine compartment door is open.

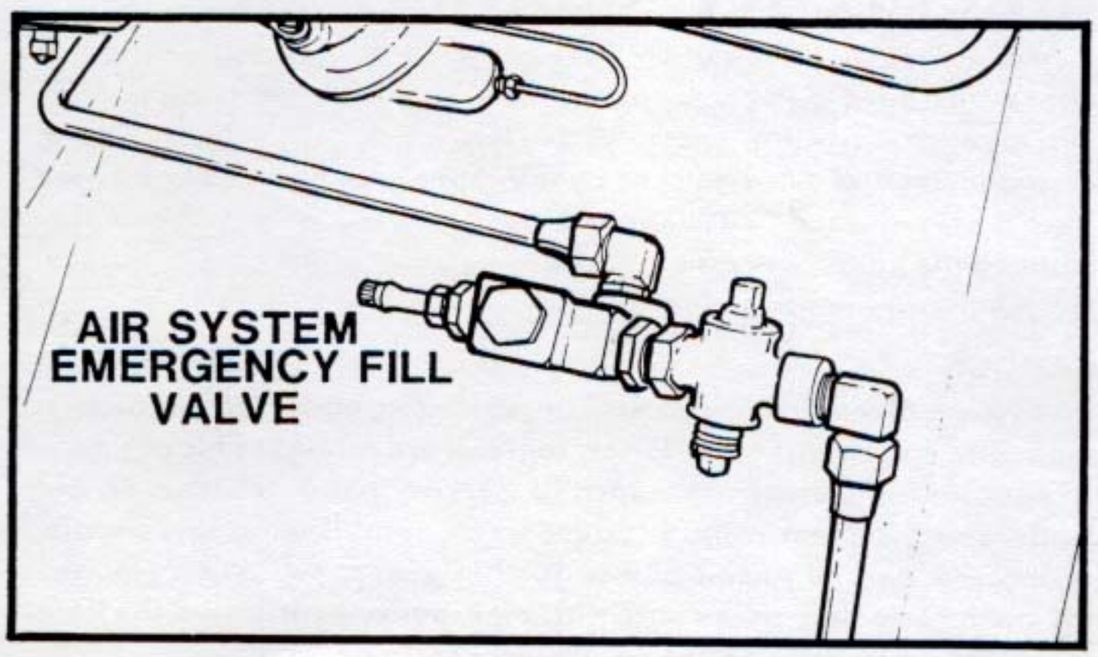


FIG. 8

Generator

A tell-tale light marked "NOT GEN." is located on the instrument panel to indicate when generator is not charging. With "MASTER" switch on and engine not running or with engine running and generator not charging, this light will be illuminated.

If, during normal operation, the "GEN." tell-tale light goes on, it indicates that the generator is not charging. Turn off all electrical accessories, except driving lights at night, to reduce electrical load on batteries, and obtain service attention as soon as possible.

Emergency Trailing Axle Unload (Optional)

A switch is mounted at the rear of switch panel to the left of driver for partially unloading the trailing axle when drive axle requires added weight to provide the necessary traction to move in extreme slippery road conditions. A beeper and low air tell-tale light will stay on to remind the driver to turn off system as soon as conditions permit.

Emergency Flashing Signal

The coach is equipped with a flashing signal system which flashes all directional signal lights simultaneously to warn traffic in an emergency. The hazard warning flasher switch mounted to the left of the driver is used to energize this signal system. A tell-tale light flashes when the system is operating.

FIG. 9

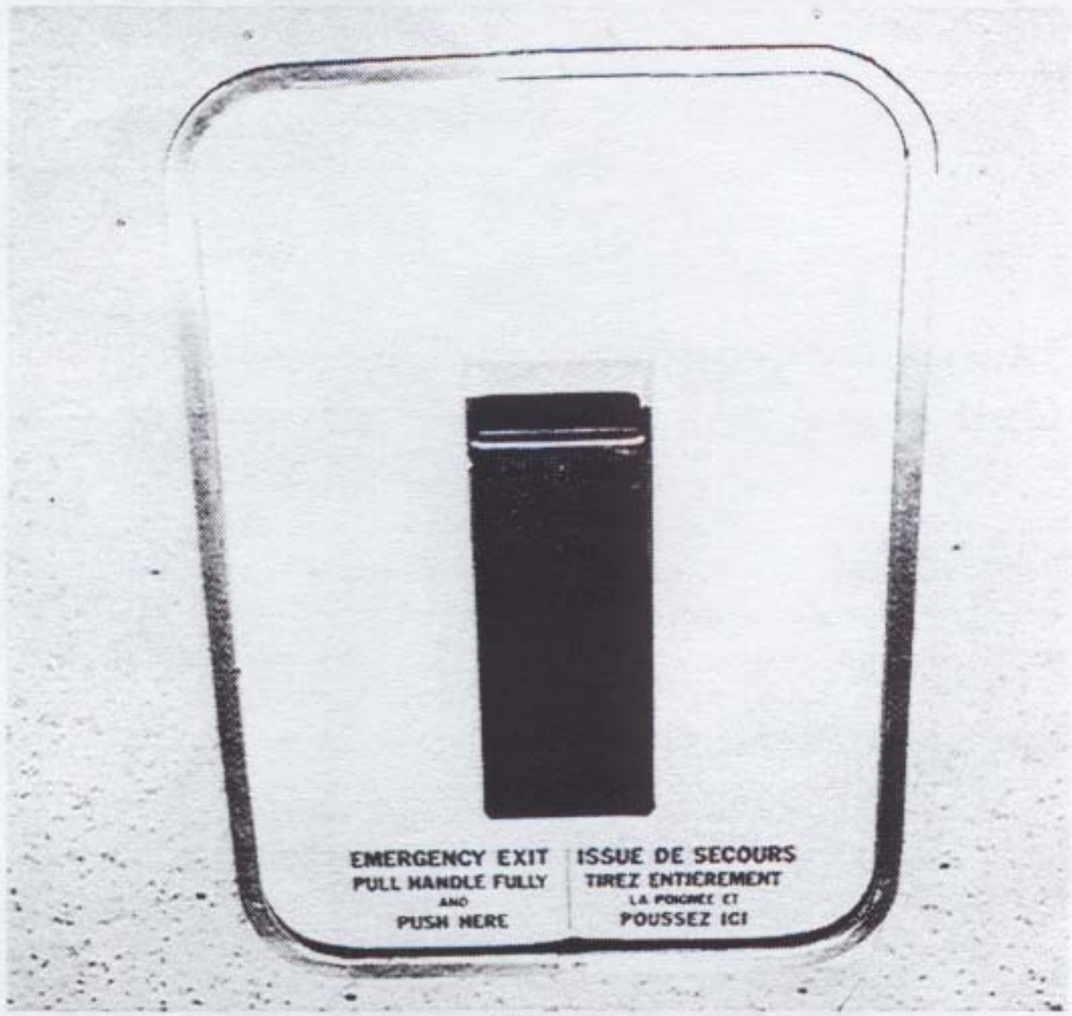


FIG. 10

Emergency Escape

Side Sash

All side passenger windows can be opened from the inside for emergency escape purposes. Window sash is hinged at the top and can be opened by pulling out and up on the release bar, then pushing window sash out. Instruction plates are mounted below the sash on release bars at each seat location.

Emergency Exit Hatch

Two emergency escape hatches are located in the roof, opening size approximately 18" x 25" (457 x 635mm). To open in case of EMERGENCY, pull handle fully to unlock and push hatch open. To close, pull hatch down with handle in open position then push handle to lock hatch.

Emergency Ventilation

For emergency ventilation the hatch may be partially opened as above then held by engaging the spring and prop mechanism. From this position, upward pressure on the hatch will release spring engagement and allow hatch to be fully opened. If hatch is to be closed from a partially open position the prop must be disengaged by either opening the hatch until prop is freed or by pivoting the prop arm out of the open end of spring.

CAUTION:

Beware of low overhead clearances if running with roof hatches open. The emergency ventilation controls are intended for use only to enable the vehicle to reach a service point in case of air conditioning system failure. Cause of air conditioning loss should be located and corrected before further operation. When trouble has been corrected, make sure that emergency ventilation controls are returned to the normal operating positions.

Tools & Safety Equipment

A fire axe is mounted to panel under dash in front of driver.

A 10 Unit first aid kit (optional) and the fuses are mounted to the left rear of the driver's seat.

The fire extinguisher is installed under the No. 2 right side passenger seat. To remove, lift and disengage catch on mounting box,lift fire extinguisher out.

Three reflector triangles in a container are located in the lower compartment ahead of the right front battery compartment.

The wheel wrench handle is mounted in the right front baggage compartment and the jack handle, wheel wrench, wooden run up block and trailing axle holdup chains are located ahead of the battery compartment. The jack is located behind the spare wheel in the tire compartment behind the front bumper. The spare wheel must be removed to gain access to the jack.

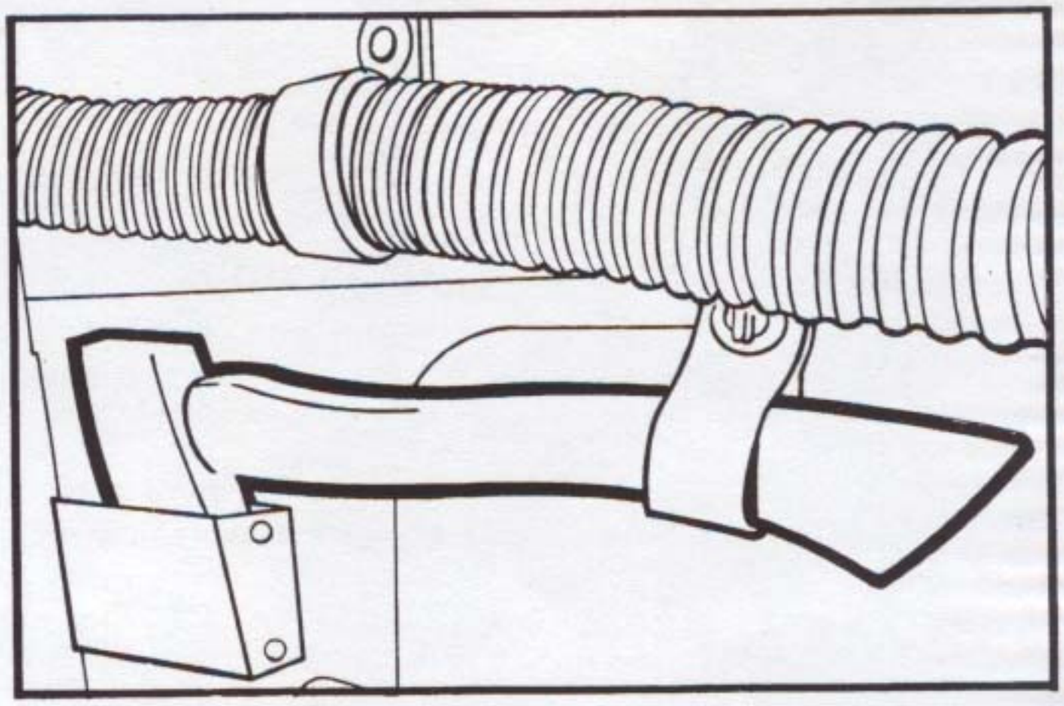


FIG. 12

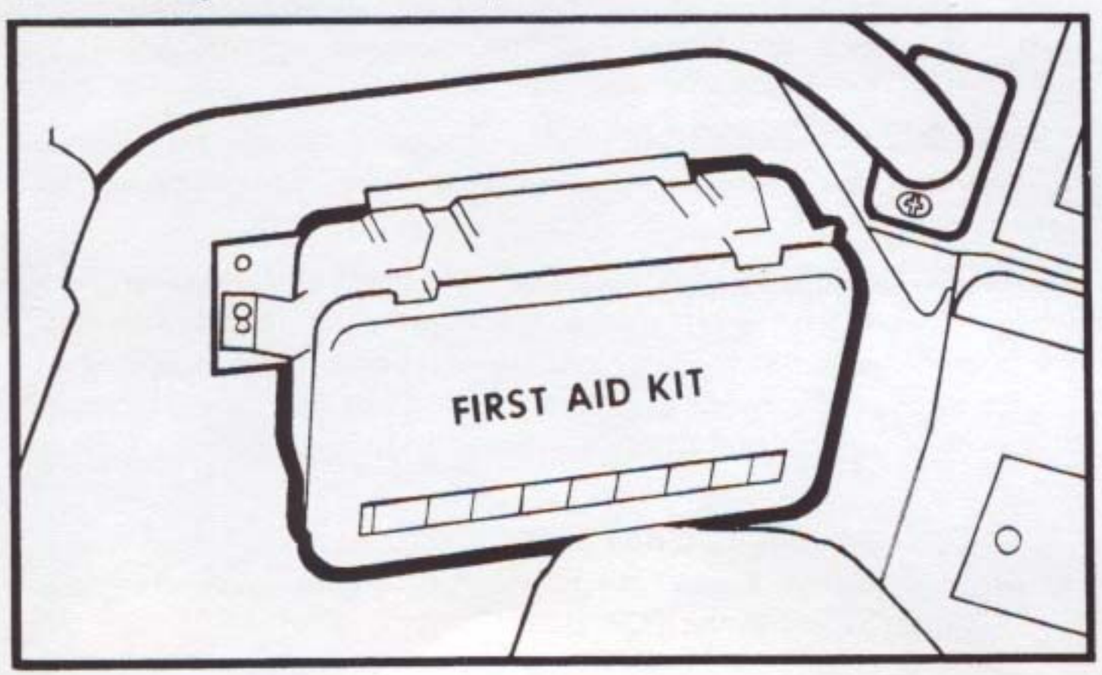


FIG. 11

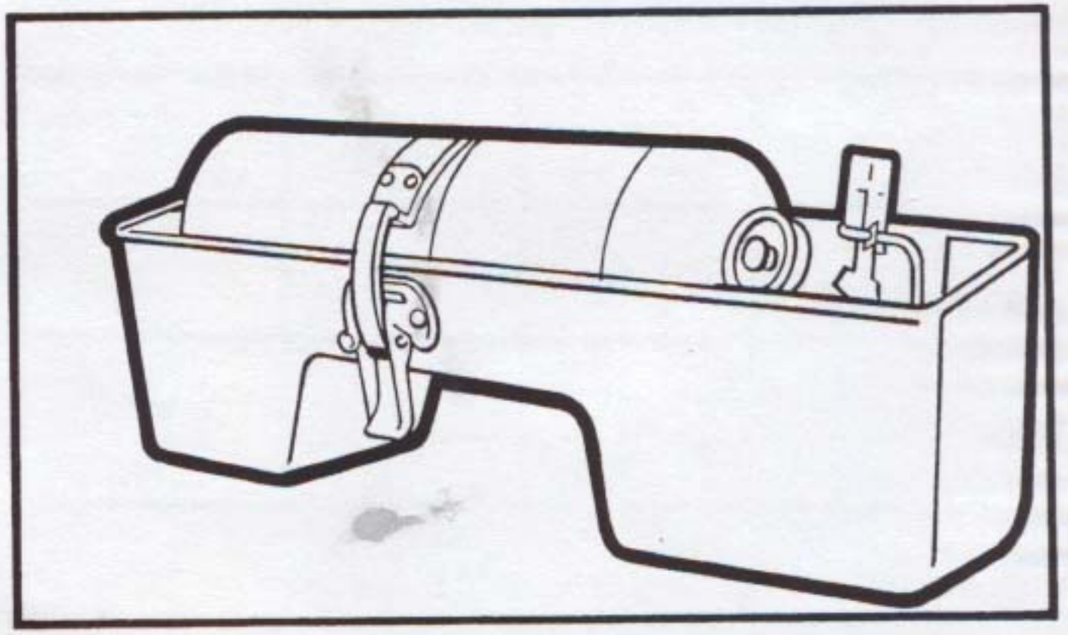


FIG. 13

Use of Lights

All interior and exterior lamps except headlamps can be illuminated with "MASTER" switch in either position.

Headlamps, Clearance & I.D. Lamps

Headlamps are controlled by a switch on the panel to the left of the driver. High or low headlight beam is selected by means of a floor mounted dimmer switch. When high beams are on, a tell-tale lamp marked "HI-BEAM" on the instrument panel will glow.

Headlamps, clearance and I.D. lamps are interconnected so that they are on at all times that headlights are on. Tail and license lights are also on.

Back-Up Lamps

Back-up lights go on automatically when the shift to reverse is made. Tell-Tale on dash indicates when back-up light is actuated.

LIGHTS ON	MASTER SWITCH	HEADLIGHT SWITCH	CLEARANCE & I.D. LIGHT SWITCH
Clearance Lights, I.D. and Tail Light Only	On or Off	Off	On
Headlights, Clearance & I.D. Lights and Tail Lights	On	On	On or Off
Headlights Only	NOT POSSIBLE		

FIG. 14

Light Switches

STEP LIGHT & CHIME: Passengers can signal driver using continuous ribbon chime switch. Entrance stepwell light will go on when door is opened only if "Step Light and Chime" switch is in the "ON" position.

CLEARANCE, I.D. SIGN AND READING LIGHTS: located on switch panel, energizes Clearance, I.D., Sign, Aisle, Running, Tail, License, Lavatory, Instrument Panel Gauge, Switch Legend Illumination and Reading light circuits. Individual reading lights cannot be turned on by passengers unless the CLEARANCE, I.D., SIGN AND READING LIGHT switch is placed in the "ON" position.

INDIRECT LIGHTS: Indirect lights are controlled by switch marked "INDIRECT LIGHTS" located on the switch panel. Lights can be illuminated with master switch in any position.

LAVATORY LIGHTS: Closing and locking the lavatory door from the inside illuminates the ceiling and "OCCUPIED" sign lights. The lavatory night light is controlled by the Clearance and I.D. lights switch.

BAGGAGE COMPARTMENT LIGHTS: Baggage compartment lights are illuminated automatically when any of the baggage compartment doors are open.

DIRECTIONAL SIGNAL SWITCH: Turn indicator lights are controlled by a switch lever on the left side of the steering column. Moving this lever in the direction of the intended turn will operate the corresponding front and rear flashing signal lights. When turn lights are on, a tell-tale light will flash in the instrument panel to the left of the steering column.

HAZARD WARNING FLASHER SWITCH: Located to the left of driver and when turned on flashes all turn lights simultaneously. Tell-tale glows with this switch in the "On" position.

In-Station Lighting (Optional)

Some coaches are equipped with connection to permit use of 110-volt lights when the coach is parked at the terminal.

The receptacle for in-station lights is located above the service compartment door at the left front of the coach. When a power cable is connected at this point, interior fluorescent lights, destination sign and underfloor baggage compartment lights are illuminated. A circuit breaker panel is located on the rear vertical wall of the compartment below the driver's floor. They must be manually reset if they open.

CAUTION:

The external connection must be 110 volt 60-cycle AC power only, and the power cable must be grounded (three prong) type. Make sure power cable is disconnected before moving coach.

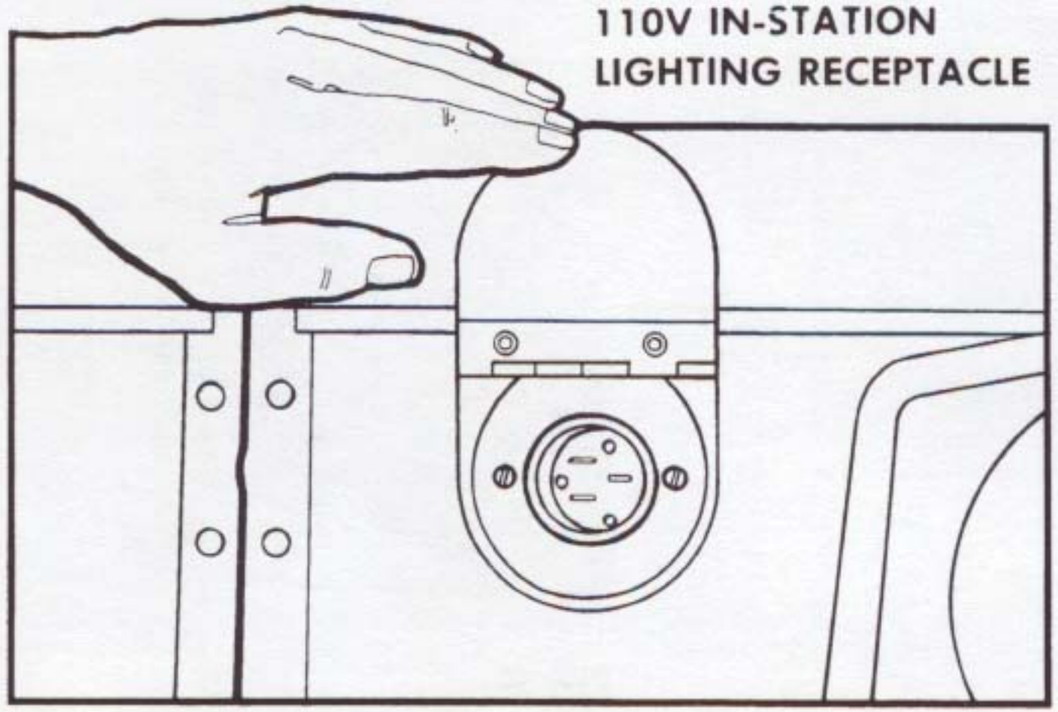


FIG. 15

Fog Lamps (Optional)

The foglights can be turned on only when the headlight switch is in the "ON" position. The foglight switch is located next to the headlight dimmer switch. Note: Headlights automatically are turned off and foglights on, when the foglight switch is pressed. To return to headlights, press foglight switch again.

Windshield Wipers & Washers

Two air-operated windshield wipers are provided, controlled by two small knobs situated at the lower right side of the instrument panel. Each knob controls its corresponding windshield wiper.

To operate wipers, turn control knob for wiper desired toward direction indicating "ON" until required speed is reached. To stop wipers turn knob to "OFF" position. Wipers will park automatically when control knobs are turned to extreme left or counter clockwise.

Air operated windshield washers have an independent washer control knob situated on the lower right side of the instrument panel alongside the two windshield wiper knobs.

To operate windshield washers, press control knob. The washers will operate for a period of time while the control knob is held in this position.

Release knob for approximately ½ minute to allow pump to refill before operating windshield washer again. Turn windshield wipers on when using windshield washers. The windshield washer reservoir is located in the left front compartment below driver's floor.

Heating & Air Conditioning

The coach is equipped with a heating and air conditioning system. A three-position switch located on the driver's switch panel is used to select either heating or air conditioning system operation depending on outside temperature. Moving the switch to the "A/C" position will place the air conditioning system in operation. Moving the switch to the "HEAT" position will operate the coach heating system. In the "OFF" position, neither heat nor air conditioning is operative. The "MASTER" switch must be "ON" and engine running before either system will function.

The "HEAT CONTROL" knob located on the driver's switch panel to the left of the driver is used to select interior temperature within the range of 72-82° F (22-28° C). Once a temperature is selected the system will automatically maintain this temperature within close limits.

An A/C Hi/Lo tell-tale light to indicate an air conditioning system malfunction is located in the instrument panel tell-tale light cluster. If this signal light flashes or stays on, turn the air conditioning system "OFF" and do not use until the cause of trouble has been located and corrected by service personnel. A clutch sensor switch, located at the compressor, has been included to warn an operator if the compressor clutch engages while the A/C system is "OFF". If this condition should occur, the signal light will come on when the A/C system is "OFF" indicating either a clutch malfunction or loss of compressor oil. The engine must be stopped immediately and the compressor drive belts removed. The trouble should be located and corrected by service personnel.

The flow of hot water from the engine cooling system to the heating and air conditioning system can be stopped in an emergency by the use of gate valves located in the engine compartment. See "ENGINE COOLING SYSTEM."

When it is necessary to operate air conditioning system with coach stationary, operate engine at fast idle by engaging the "FAST IDLE" switch on the driver's switch panel.

The auxiliary passenger A/C unit can be operated whenever main A/C is on. A switch at rear end of switch panel provides ON/OFF control.

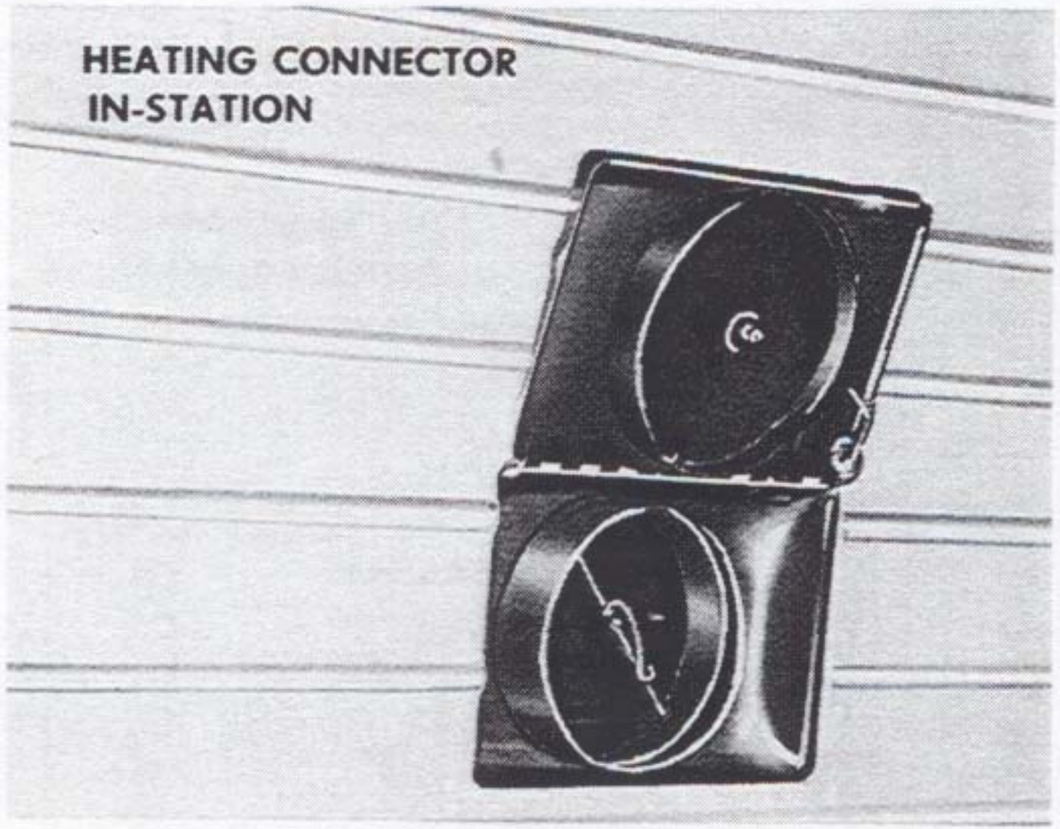


FIG. 16

In-Station Heating & Air Conditioning (Optional)

Some coaches are equipped with a duct connection to permit heating or cooling of the coach interior from a remote unit while the vehicle is parked at a terminal where such facilities are available. The connection is located at the front of the coach below and slightly to the rear of the driver's window.

A door secured by a latch closes and seals the opening when not in use. **The door must be properly closed and locked during normal operation, otherwise loss of heated or cooled air will result.**

Make sure that the connection has been removed and the door closed and locked before moving coach.

Driver's Heater & Defroster

A heater and defroster system is provided for the driver. This system is independent of the main heating system. Fans are controlled by one toggle switch for high and low speeds located on driver's switch panel.

The flow of water to the driver's heater system is controlled by a manual driver's heater water control valve located at the driver's left just above the floor. When the valve handle is in the horizontal position the valve is open; it is closed when the valve is turned clockwise to the vertical position. Partial flow can be obtained by moving the valve handle to an intermediate position.

A control located below the dash to the left of the instrument panel regulates the flow of fresh or recirculated air into the driver's heater system as required.

The flow of heated or cooled air to the driver's feet area is controlled by an adjustable gasper located under dash to the right of the driver. The air flow to the windshields is continually open to prevent the possibility of fogging.

CAUTION:

Avoid too high temperature in the driver's area. This tends to induce drowsiness, affecting your ability to operate the coach safely. It may also affect the temperature in the passenger compartment. See "DRIVER'S AIR CONDITIONING".

Driver's Air Conditioning

The main air conditioning system switch must be in the "ON" position and system in operation to operate the driver's air conditioning system. The driver's air conditioning switch controls the air conditioning in the driver's area only. In humid weather, air conditioning system will assist in defrosting the windshields.

WATER CONTROL VALVE

FIG. 17

The driver's heater and defroster motor fans are controlled and operate independently of the driver's air conditioning system. The motor fan switch has two positions for high or low speed control. To control temperature in the driver's area, with driver's air conditioning on, turn water valve to closed position to lower temperature and open to raise temperature. The water valve is located to the driver's left above the floor. When the driver's air conditioning is switched on, the fans will cut in automatically on low speed with fan switch at "low speed" or "off" position.

NOTE: Refer to "DRIVER'S HEATER AND DEFROSTER" system for introduction of outside or inside recirculated air. The damper for outside air must be closed when the driver's air conditioning system is turned on.

Ventilation

The operator should always attempt to introduce as much outside air as possible without seriously affecting the operation of the heating or air conditioning systems. It should be remembered that outside air can only enter the coach if air is being exhausted. Also, the interior of the coach should be slightly pressurized to prevent dust and moisture from entering the vehicle.

When outside temperature is very high and maximum cooling is required, all adjustable intakes in driver's area (see page 7) and exhaust openings in entrance door should be closed. This is also true in extremely low outside temperatures when maximum heating is needed.

Provision is made to introduce fresh air into the coach heating system. Air intakes are provided at each side of the vehicle below the windows through which outside air enters the blowers and is mixed with recirculated air. Fresh air can be introduced through an adjustable intake in the Driver's heater an defroster system. (See "DRIVER'S HEATER AND DEFROSTER") and through a "GASPER" located under the dash to the left of the driver.

Provision is made for emergency ventilation in case of air conditioning system failure; refer to "Emergency Conditions" elsewhere in this manual.

FIG. 18

FIG. 19

Driver's Seat

Driver's seat may be adjusted fore and aft by pushing in lock lever located at left front of seat. When seat is positioned, release lever. The seat back may be tilted by pulling the back tilt knob at the left rear side of seat. To return seat back to a forward position, grasp seat back and pull forward while pulling tilt knob. The back of seat cushion can be tilted up or down by grasping the cushion tilt lever at left center of driver's seat and turning forward to lower and backward to raise. To adjust seat height press down lever on right side of base and lower seat to bottom position, release lever and pull seat up to desired height. Release seat and it will lock in place.

The seat is supplied complete with a retractable seat belt as required by State and Federal Regulations. The seat belt may be fastened by slowly pulling the buckle over and across the lap to engage the buckle on the tongue. Sudden pulling of the belt will lock the reel. No special adjustment is required as the reel device is self adjusting. If seat belt assembly operation becomes defective, report to maintenance personnel.

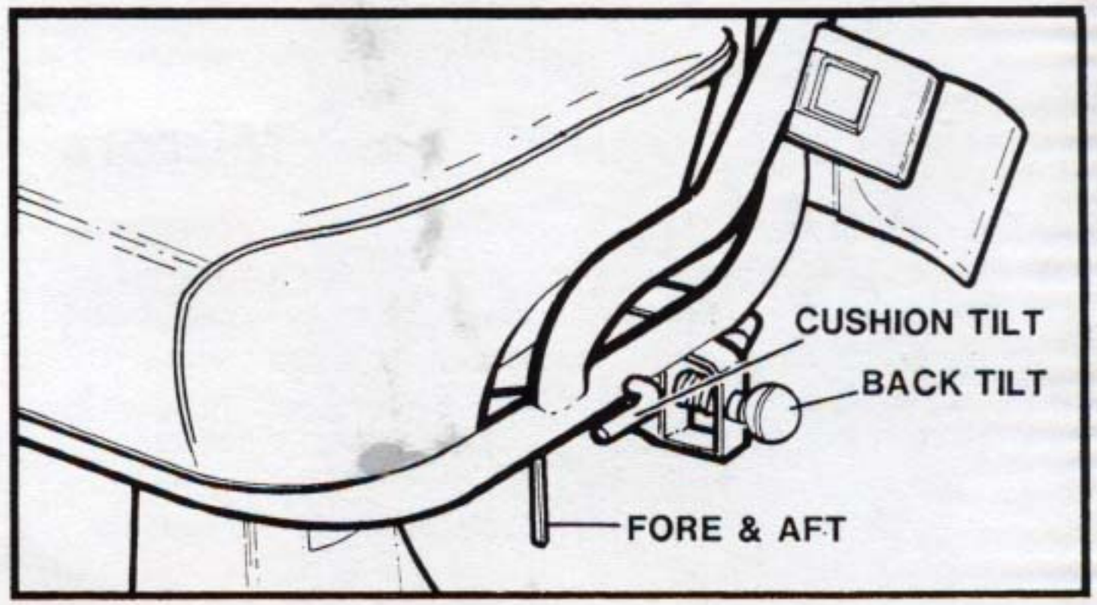


FIG. 20

Driver's Panel and Night Curtain (Optional)

A combination acrylic panel and night curtain is provided for driver protection from the rear and to close off the driver's area during night time operation. The panel extends from the driver's guard rail to slightly above the top of the passenger windows. The roller type curtain can be drawn at the driver's convenience.

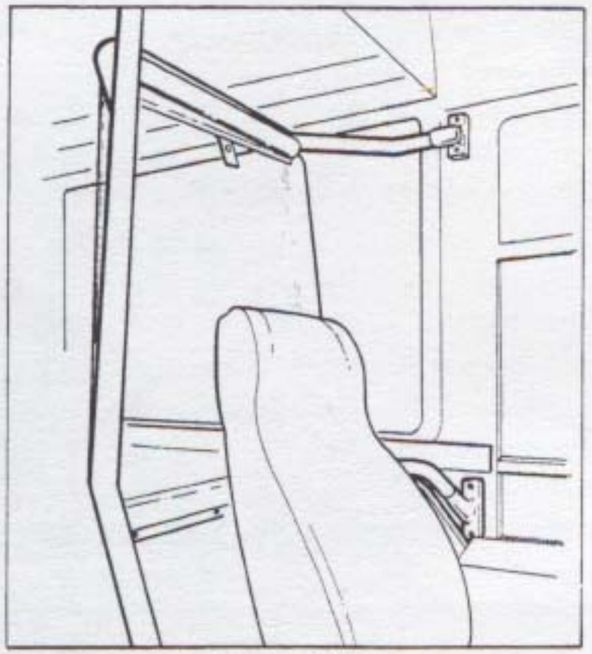


Fig 21

Heated Exterior Rear View Mirrors (Optional)

The coach is equipped with large exterior rear view mirrors for improved visibility. The mirror heads are aerodynamically designed to reduce road dirt and moisture build-up on the glass surface. The mirrors are heated to prevent frost-up in cold weather and are activated by an "On-Off" switch on the driver's L.H. Switch Panel. In addition, a 6" diameter convex mirror is mounted on top of both L.H. and R.H. rear view mirrors to allow a larger wide angle view and are separately adjustable.

AM/FM Radio and Public Address System

The coach is equipped with a heavy duty transistorized AM/FM stereo 24-volt Radio and Public Address system. The unit is installed to the left of the driver and has easily accessible controls. The system uses a common amplifier for the radio and P.A. unit; however, control for each is selected separately.

High qualtiy speakers are installed along the Parcel Racks and in the left and right hand Parcel Rack end caps. Both driver's and passenger's speakers are controlled separately by toggle switches in the driver's compartment.

Driver's Windshield Fan (Optional)

A Windshield Fan with wire guard is available to be installed on the dash. It is mounted on a swivel base and is used to assist clearing the windshield in high humidity conditions. The control switch is installed in the mounting base.

Stepwell Heat (Optional)

Heat is supplied to the stepwell area via a heat vent to the passenger Modesty Panel.

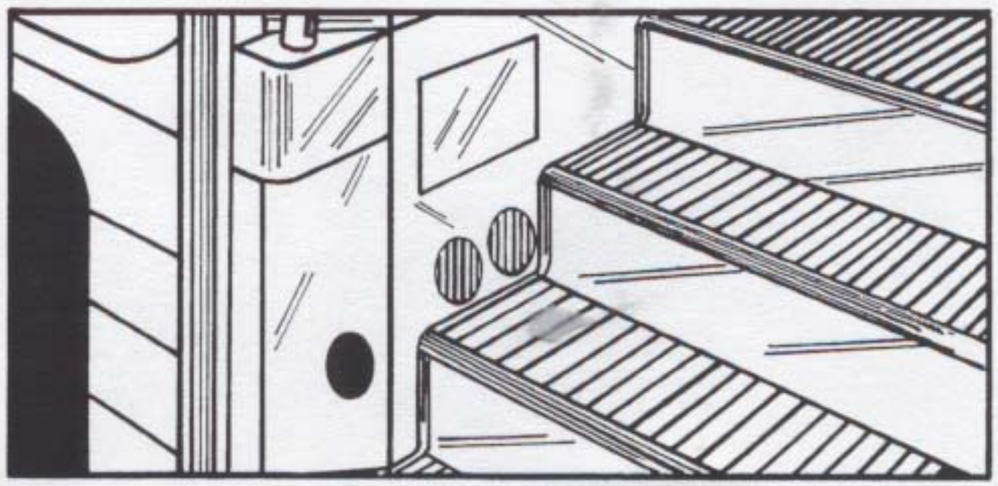


FIG. 22

Entrance Door Control

The entrance door is provided with an air-operated lock. The door is opened or closed by means of door control handle on the dash to the driver's right. To open, turn handle clockwise; counterclockwise to close.

The air lock engages automatically when the door is closed, disengages to open.

In the event that the air lock mechansim does not release when an attempt is made to operate the entrance door handle, depress the overrule switch located under the dash near the center of the coach. This will release the air lock regardless of the position of the door control handle.

The entrance door can be opened from outside the coach by means of a release knob located below front windshield. After pushing release knob, pull door handle and open.

FIG. 23

IMPORTANT

If air lock fails to engage when entrance door is closed, immediately advise service personnel at next service stop. Do not attempt to engage while coach is in motion.

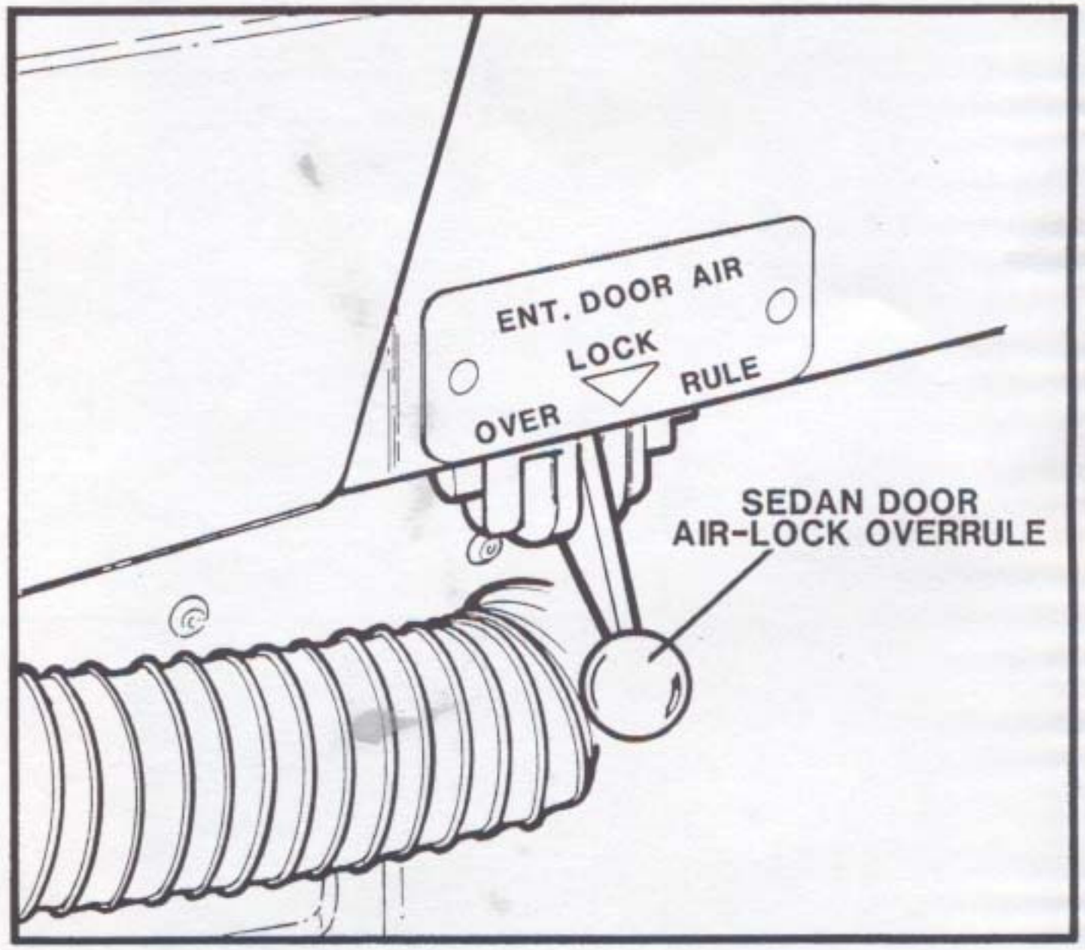


FIG. 24

Bi-Part Entrance Door

Bi-part entrance door may be opened or closed from inside or outside the vehicle. A toggle switch is provided on the switch panel to the left of the driver. To open the door from the outside, the switch is located on right side exterior rear of door.

A manual dump valve is provided to the right of the steering column to operate door in the event of an electrical failure. The door may also be opened from the outside of the coach by opening the front electrical panel access door and pulling the release cable knob in upper left hand corner.

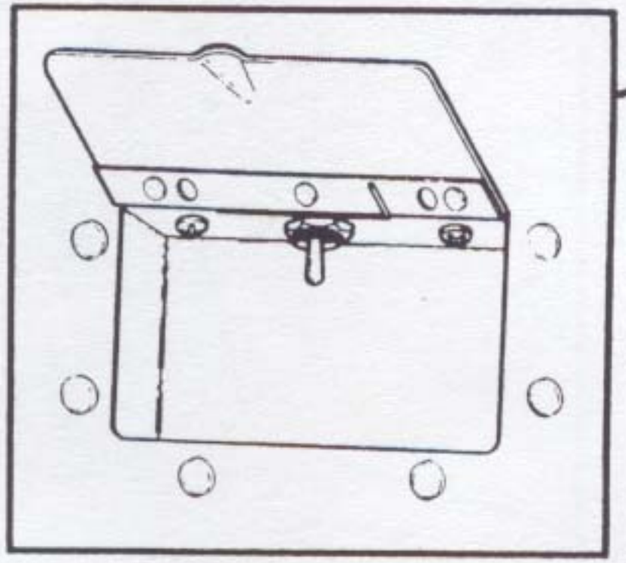


FIG. 26

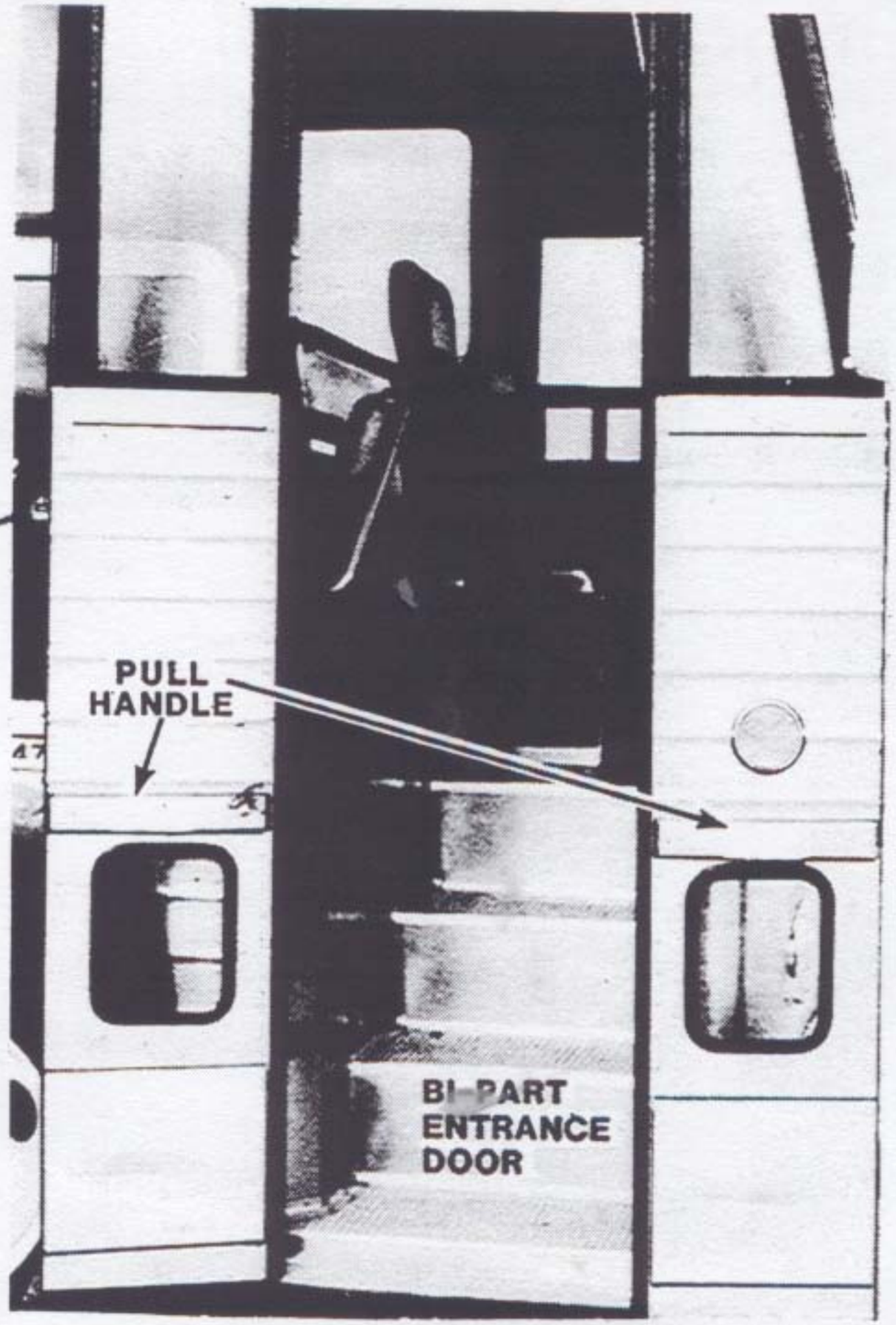


Fig. 27

Retractable Entrance Step
(Optional)

To extend RETRACTABLE ENTRANCE STEP activate switch with park brake applied and entrance door open. A tell-tale light on instrument panel will be energized when step is extended.

The step may be retracted by operation of the switch or it will retract automatically when releasing park brake or closing entrance door.

Upon engine start-up, it may be necessary to build up coach air pressure to fully retract entrance step and turn off tell-tale.

FIG. 28

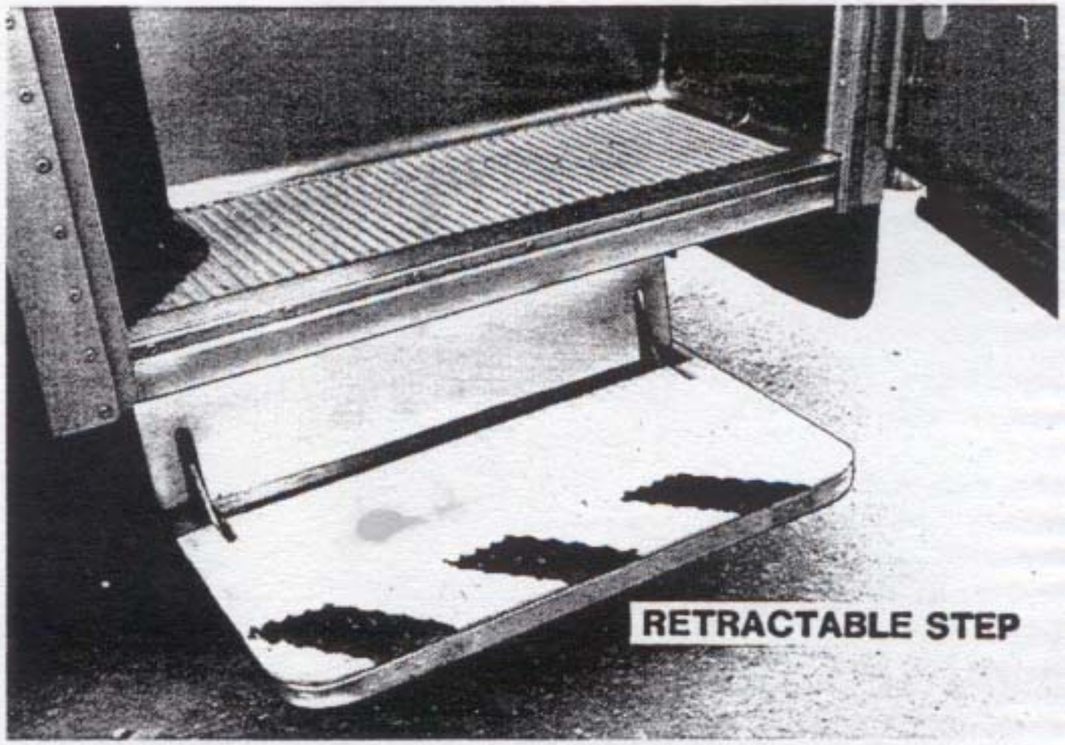


FIG. 29

Destination Sign Operation

Open sight hole and move destination sign to desired designation. Rotate handle counterclockwise to take up slack in mechanism. This will lock upper roller to prevent sign from moving while coach is in motion.

FOR PASSENGER SAFETY, FEDERAL LAW PROHIBITS OPERATION OF THIS BUS WHILE ANYONE IS STANDING FORWARD OF THE WHITE LINE
REMAIN SEATED AND DO NOT TALK TO DRIVER WHEN COACH IS IN MOTION
YOUR OPERATOR

DESTINATION SIGN CRANK

FIG. 30

Luminator

Electronic Destination Sign (Optional)

The automatic solid state electronic destination sign system is controlled by a console located above the driver's side window. Pre-programmed codes may be keyed into the console to display the desired destination or public relations message.

The "DESTINATION SIGN" switch on the control console must be in the "ON" position. Activate the driver's display by placing the toggle switch on the left hand side of the control console to the "ON" position. To illuminate the destination sign lamps, the "CLEARANCE & I.D. LAMPS" switch on the switch panel must be in the "ON" position. To enter a destination into the system or change a destination displayed. refer to the destination code list and proceed as follows:

1. Press the "DEST A" key on the control console keyboard.
2. Press the number keys to enter the desired code.
3. Press the "ENTER" key.

There will be a normal 5 second delay time before the display registers. If an error is made while entering a destination code, press the "CLEAR" key and enter the correct code. When a new code is entered, it will automatically override the previous display.

Due to the relatively high current requirements of the destination sign and controls, it is recommended these features be used only when the engine is running.

Engine Operation

Controls necessary to start and stop engine from the operator's compartment are mounted on the instrument panel in front of driver. These controls are:

"MASTER" switch: must be in the "ON" position when starting engine. When switch is pushed "OFF" the engine will stop.

"STARTER" switch: is of the "momentary-on" type, and must be held in the depressed position to engage the starter. When released, switch will return to normal position.

"EMERGENCY STOP" switch: is of the "momentary-on" type used to stop engine if it fails to do so when the "MASTER" switch is moved to the "OFF" position. The switch must be pushed up to operate the emergency stop mechanism.

"ENGINE OVERRULE" is obtained by holding the "STARTER" switch in the depressed position (on coaches equipped with automatic engine shutdown system). Switch should be held on long enough to move coach to safety.

"GAUGES AND TELL-TALE LAMPS" Oil pressure and temperature gauges, together with "LOW OIL" and "HOT ENG." tell-tale lamps, are located in instrument panel in front of operator. A buzzer sounds when "HOT ENG." or "LOW OIL" tell-tale flashes.

On coaches equipped with an air filter restriction indicator (located in the engine compartment) periodic checks should be made to determine filter condition. Color coded readings lock into place and indicate when air filter needs changing.

Starting Engine

CAUTION:

Special precautions are necessary with turbo-charged engines to avoid possible turbine damage. After starting, run it at low idle for two minutes to permit lubricant to flow to the turbocharger. Then run it at fast idle and check oil pressure before attempting to drive the vehicle.

Before shutting the engine down, allow it to idle for 5 minutes. This will ensure that the turbine speed has dropped. DO NOT SHUT THE ENGINE DOWN DIRECTLY FROM HIGH RPM.

1. Make sure that the parking brake control button is pulled up, applying air-operated parking brakes.
2. Make sure the remote control switch in rear panel is set for front operation. Transmission shift lever should be in neutral position.
3. Place "MASTER" switch in the "ON" position.
4. Press "Start" button to engage starter. Hold button for 3 seconds after engine starts to allow oil pressure build-up preventing automatic shutdown.
5. Refer to "EMERGENCY CONDITIONS" for instructions regarding starting engine at rear of coach.

CAUTION:

Do not engage starter for longer than 15 seconds at a time. Allow starter motor to cool before a second attempt. Continuous use of the starter without allowing a cooling period may damage the starter motor.

Thermal Time Delay (Optional)

A Thermal Time Delay Relay system is available. This system protects the starter motor from false restart or overrun. It provides a 20-second timed start period followed by a few seconds cooling period before starter can be reengaged.

Cold Weather Starting

The coach is equipped with a cold weather starting fluid cup, located on the top of the engine blower housing. If temperature is below 40 degrees (4 degrees C) it may be necessary to use starting fluid capsules. Use one 7 c.c. capsule at temperature above 0 degrees F (-18 degrees C), or two at lower temperatures. DO NOT USE MORE THAN TWO FLUID CAPSULES. To use capsules, lift cover of starting fluid cup, insert capsule, force down over pointed tube in cup and squeeze until all fluid enters cup. Remove capsule and start engine.

FIRE WARNING

Starting fluid used in the capsules is highly inflammable, poisonous and is an anaesthetic: Do not smoke while using or handling capsules, and keep away from flame or high temperatures. Avoid inhaling fumes produced by starting fluid.

Pressurized Ether Start System (Optional)

A pressurized cold weather ether starting system is available for use in extremely cold weather. The system is operated by a guarded switch on the rear of the switch panel to the left of the driver. The switch is wired to the starting circuit and becomes inoperative after engine is running and fuel pressure reaches 9 lbs. This prevents ether injection during engine operation.

Warm-Up

After starting the engine, operate it at a fast idle speed by engaging "FAST IDLE" switch on driver's panel. Air-operated parking brakes must be on before the "FAST IDLE" control will operate; and should be kept applied during warm-up. Observe gauges and tell-tale lamps frequently during warm-up and subsequent operation. If abnormal conditions develop stop engine immediately and determine cause.

Stopping Engine

1. Apply parking brake and place transmission shift lever in neutral.
2. Idle engine for about 30 seconds, then move the "MASTER" switch to the "OFF" position.

On turbo-charged engines, before shutting the engine down, allow it to idle for 5 minutes. This will ensure that the turbine speed has dropped. DO NOT SHUT THE ENGINE DOWN DIRECTLY FROM HIGH RPM.

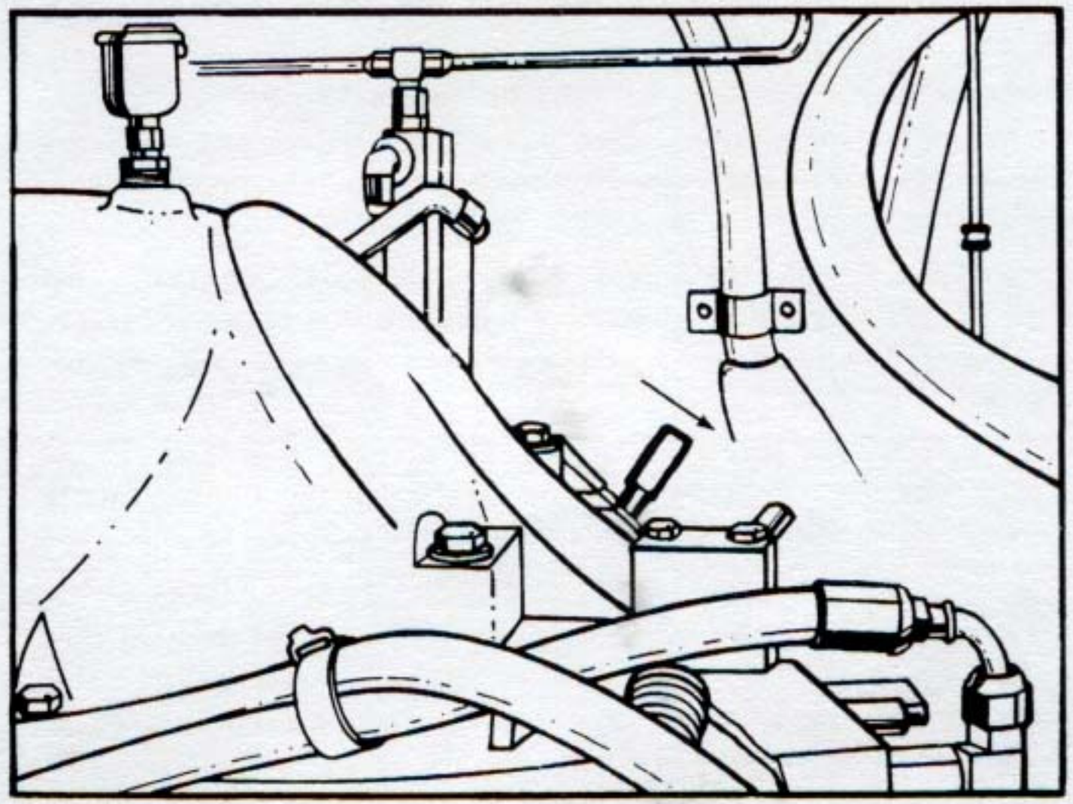


FIG. 31

Engine Emergency Stop (Non-Turbo Only)

The "EMERG. STOP" switch on the instrument panel is provided for stopping the engine ONLY when placing the "MASTER" switch in the "OFF" position fails to stop the engine. When the "EMERG. STOP"

switch is moved to the "ON" position, it energizes a solenoid which releases a cam on the engine air choke valve permitting it to close, shutting off the air supply to the engine.

IMPORTANT

When the "EMERGENCY STOP" switch has been used to stop the engine, the choke valve must be reset manually before the engine can be operated. Rotate cam until shoulder engages cam lock.

The emergency stop is to be used ONLY when pushing the "MASTER" switch fails to stop the engine. Do not restart until the reason for loss of control has been corrected.

Booster Battery Starting

CAUTION:

Any procedure other than the following could result in:

(1) **Personal injury caused by electrolyte squirting out of the battery vents.**
(2) **Personal injury or property damage due to battery explosion.**
(3) **Damage due to the charging system of the booster vehicle or of the immobilized vehicle.**

DO NOT attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen, or if the electrolyte fluid cannot be seen, do not attempt to start the vehicle with jumper cables as long as the battery remains frozen. Both the booster battery and the discharged battery must be treated carefully when using jumper cables. Follow EXACTLY the procedure outlined below, being careful not to cause sparks.

Connecting Booster Battery and Jumper Cables

(1) Set parking brake, turn off lights, heater and other loads. Remove 12 Volt leads at battery.

(2) Remove vent caps from both the booster and the discharged batteries. Lay a cloth over the open vent wells of each battery. These two actions help reduce the possibility of explosion which is always present when connecting a "live" booster battery to a "dead" battery.

(3) Attach one end of one jumper cable to the positive terminal of booster battery (identified by a red color "+" or "P" on the battery case, post or clamp), and the other end of the same cable to the positive terminal of the discharged battery.

DO NOT permit vehicles to touch each other as this could establish a ground connection and counteract the benefits of this procedure.

(4) Attach one end of the remaining negative (–) cable to the negative terminal (black color "–" or "N") of the booster battery, and the other end to ground location on the vehicle being started. DO NOT CONNECT DIRECTLY TO NEGATIVE POST OF DEAD BATTERY - taking care that clamps from one cable do not inadvertently touch the clamps on the other cable. DO NOT lean over the battery when making this connection.

NOTE: The ground is to be at least 12 inches from the battery filler caps, providing good electrical conductivity and current carrying capacity.

Disconnecting Booster Battery & Jumper Cables

(1) Taking care that clamps from one jumper cable do not inadvertently touch clamps on the other jumper cable, disconnect jumper lead from ground location on the vehicle being started. DO NOT lean over the battery when disconnecting this lead.

(2) Remove remaining end of negative (–) jumper cable from the booster battery.

(3) Remove one end of the remaining jumper cable from positive terminal of the discharged battery, then remove the other end of the same cable from positive terminal of the booster battery.

(4) Remove cloths from open vent wells of each battery. Discard cloths as they may have corrosive acid on them. Install vent caps on both the booster and the discharged battery.

Remote Control Panel

The remote control electrical panel used for rear operation of the engine is located in the engine compartment at the left hand side. To gain access to the panel open rear engine compartment doors.

Operation of Engine at Rear

Switches for starting and stopping the engine at the rear are mounted on switch panel at left side of engine compartment. Open rear engine service doors to gain access to switch panel.

Starting Engine at Rear

IMPORTANT: Before attempting to start engine at rear of vehicle make sure transmission shift lever is in neutral and apply parking brake.

1. In operator's compartment place "MASTER" switch in the "ON" position.

2. In the engine compartment, put engine switch in upper position (RUN).

3. Move remote switch to bottom position and hold until engine starts. Use the same precautions regarding use of starter as explained under "STARTING ENGINE."

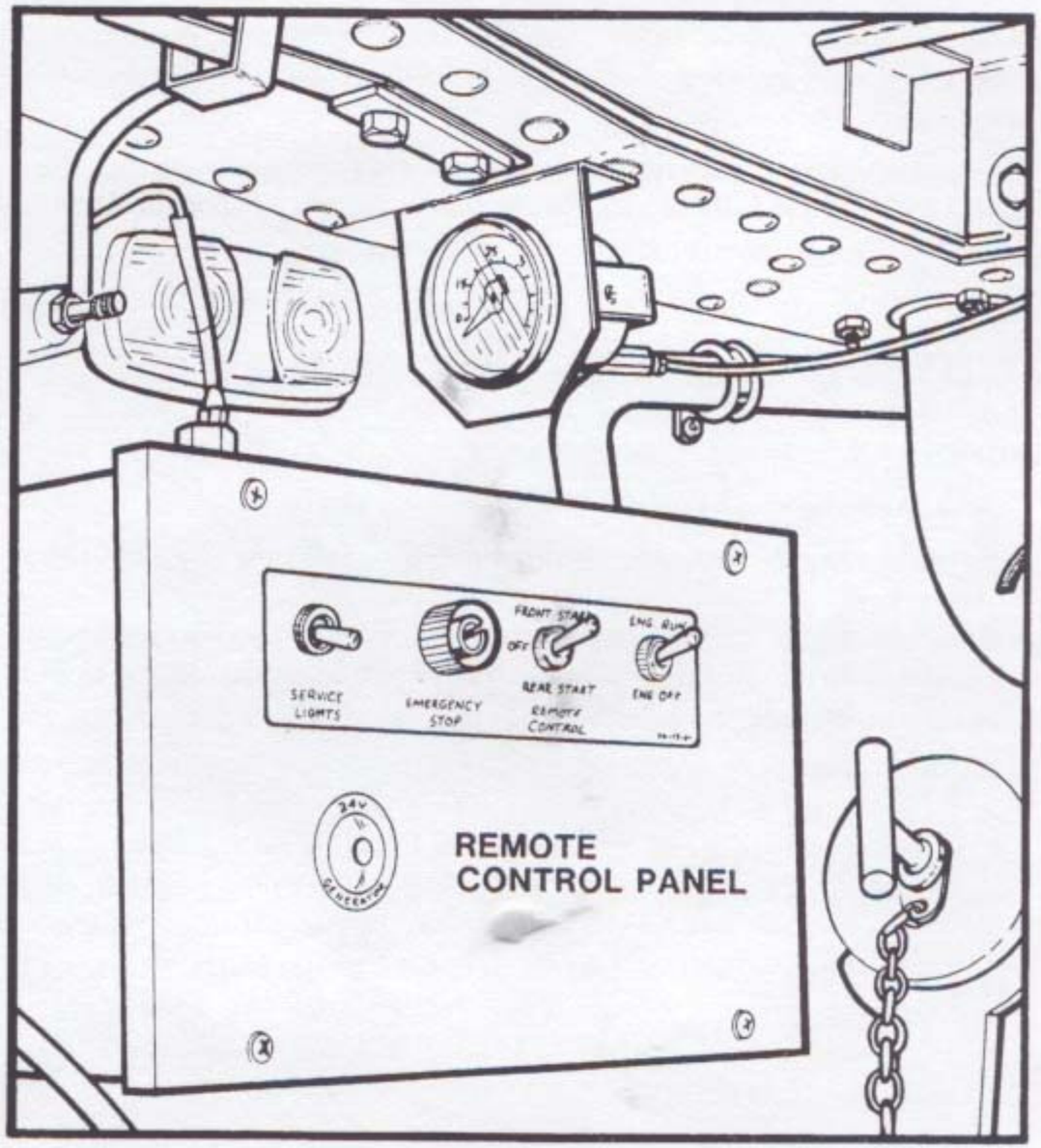


FIG. 32

Stopping Engine at Rear

To stop engine at rear, place "ENG. RUN" switch to "ENG. OFF" position.

IMPORTANT

In emergency only, if "STOP" switch does not stop engine, push in "EMERGENCY STOP" switch to release air choke valve cam. Reset emergency stop after engine has stopped, as explained under "ENGINE OPERATION."

CAUTION:

If necessary to work on engine without engine running, place "REMOTE CONTROL" and "RUN" switches in "OFF" positions. This breaks circuit to front and rear starter and prevents accidental starting of engine.

Use of Service Brakes

The coach is equipped with air-operated brakes which are applied using the foot pedal to the left of the accelerator pedal. The amount of foot pressure applied to the pedal determines the extent of brake application.

The best braking action is obtained by making the initial application gradually to obtain the degree of braking required, then gradually reducing foot pressure as the speed of the coach is reduced, so that only slight pressure remains in the brake chambers at the end of the stop.

Stop lights on the rear of the coach are automatically applied when the brake pedal is depressed. A tell-tale light on the dash shows when stop lights are activated.

IMPORTANT

"Fanning" or "Pumping" the brake pedal is not recommended. This practice does not increase the effectiveness of the brake system, but wastes air and causes unnecessary wear on brake parts. Brake chamber and line pressure is not increased, instead reservoir and line pressure is reduced.

Before brakes can develop their full effectiveness, coach air system pressure must be at least 100 lbs. (690 kPa). Observe the air pressure indicated on the air pressure gauge at frequent intervals during operation. If the "LOW AIR" tell-tale light flashes and buzzer sounds, stop vehicle immediately and determine cause before proceeding.

Parking & Emergency Brakes

The coach is equipped with air-operated parking and emergency brakes. The control valve for parking and emergency brakes is located to the right of the driver's seat on a bracket attached to the grab rail. A hinged cover over the valve is provided on later coaches to guard against accidental release of park brakes. Operation of the system is as follows:

NORMAL OPERATION: The control valve button should be pushed in allowing service brakes to operate normally.
LOSS OF AIR PRESSURE: A warning tell-tale light will flash and buzzer will go on when air pressure drops below 70-75 lbs. (483-517 kPa). Cause of pressure loss should be corrected before further operation.

In compliance with Federal and State regulations, all buses manufactured after September 1976 are equipped with an emergency modulated brake system.

In the event of air pressure loss in the service brake system, air pressure, modulated by the drivers brake pedal, is supplied from the emergency tank to the emergency or park chambers on the rear axle. A minimum of three brake applications and releases are possible, up to the point when pressure is so low as to automatically trigger the park brakes to come full on.

IMPORTANT

BEFORE STARTING ENGINE:

1. Make sure that parking brake is applied (control button is up).
2. Gearshift lever in "neutral".
3. DO NOT Depress clutch when starting engine. (Standard Transmission Only).

BEFORE MOVING COACH:

1. Air pressure gauge must read 100 p.s.i. (689 kPa) or more.
2. Make a full service brake application. Hold service brake in applied position.
3. Push parking brake control button down. Parking brakes should release.
4. If brakes do not release, reduce air pressure to below 75 p.s.i. (517 kPa) by pumping brake pedal. Operate engine until compressor cuts out, then repeat above procedure.

DO NOT ATTEMPT TO BRAKE COACH FREE IF BRAKES FAIL TO RELEASE

PARKING

1. Gearshift lever in neutral.
2. Always apply parking brakes (control button up) before leaving coach. Brakes will remain applied even if coach air pressure is lost.

TO EMERGENCY FILL PARK BRAKE SYSTEM APPLY AIR TO VALVE LOCATED IN TOOL COMPARTMENT.

NOTE: Air pressure gauge on dash does not show parking brake reservoir pressure. If pressure on gauge drops during operation, **four parking brake applications can still be made.** Parking and emergency brakes will not apply automatically until parking reservoir pressure drops below 40 lbs. (276 kPa). If pressure on gauge drops below 70-75 lbs. (487-517 kPa) during operation, "LOW AIR" tell-tale will flash and warning buzzer will sound. **Coach should be stopped immediately and cause of air loss corrected before proceeding.**

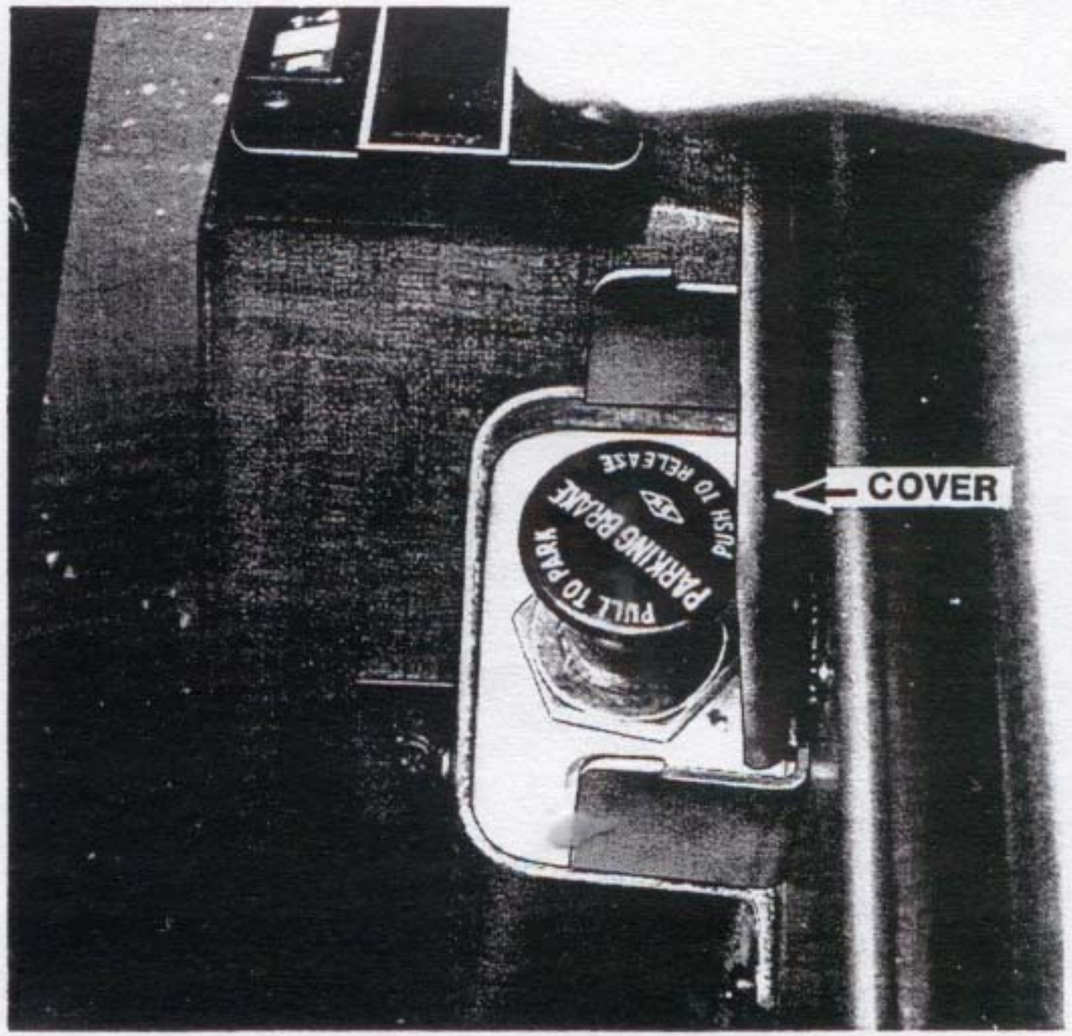


FIG. 33

Jacobs Engine Brake

(Opt.)

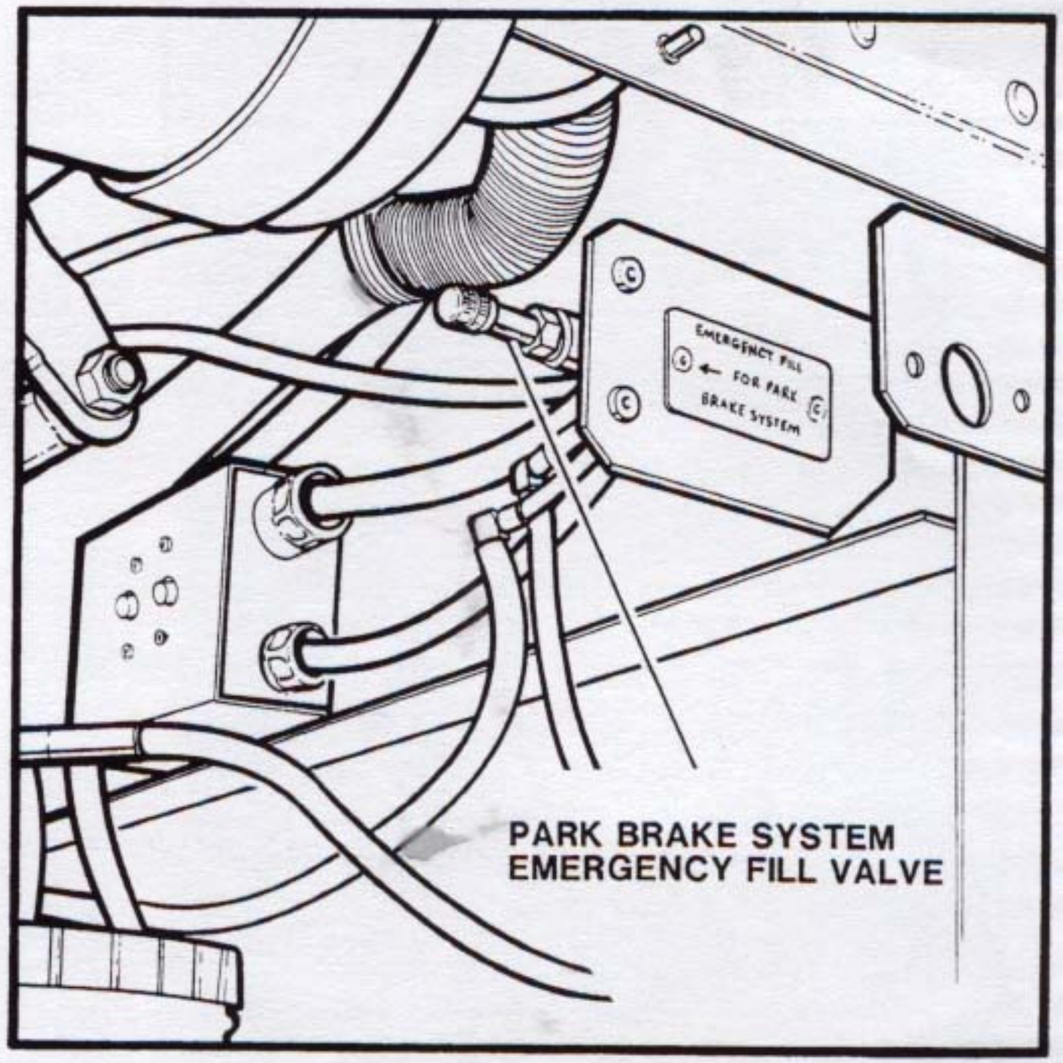
1. Place dash switch in "on" position after vehicle starts in motion. Select LOW or HIGH position depending on terrain and braking effect desired. Employ normal driving habits as secondary switches on clutch and accelerator control engine brake operation. Slight pressure on either clutch or accelerator pedals will deenergize engine brake. On automatic transmission equipped coaches a clutch switch is not used and engine brake operation is controlled by accelerator switch alone.

2. Maintain governed speed of vehicle engine when engine brake is in use to obtain maximum retarding. Utilize service brakes to reduce or maintain speed and engine R.P.M. appropriate to gear or range selected. On descent of steep grades the engine brake itself may be insufficient to maintain vehicle speed desired, up-shifting (in automatic transmissions) can occur if engine R.P.M. is over range speed, and reduce effectiveness of engine brake.

3. Place dash switch in "off" position when vehicle is parked.

Park Brake System Emergency Fill

Park brake air system may be filled from an external source by applying air to the valve located in the front left side compartment. This will fill the park brake system only.



PARK BRAKE SYSTEM
EMERGENCY FILL VALVE

FIG. 34

Use of Transmission (Standard)

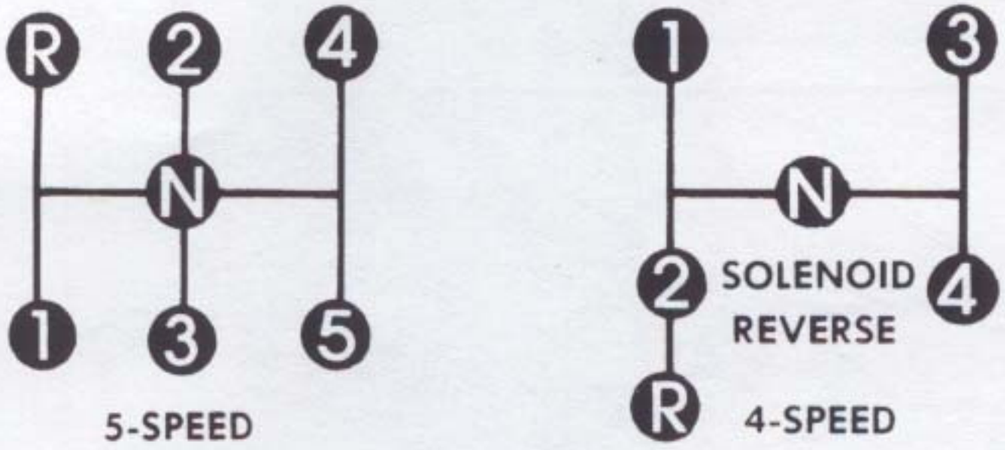


FIG. 35

A conventional shift lever located to the right of the operator's seat is used to select transmission gears.

Always start coach in motion at the lowest possible engine speed to prevent unnecessary clutch wear.

CAUTION:

When parking vehicle, gearshift should always be left in "NEUTRAL POSITION".

A conventional shift lever located to the right of the operator's seat is used to select transmission gears.

Always start coach in motion at the lowest possible engine speed to prevent unnecessary clutch wear.

Use of Clutch (5-Speed)

The clutch used with 5 speed transmissions employs a clutch brake to facilitate forward or reverse gear selection. The clutch brake is engaged at the bottom end of clutch pedal travel approximate . 1" (2.5 cm) before pedal contacts the floor. To select first or reverse gear the clutch pedal should be completely depressed to utilize the clutch brake and give a smooth gear engagement. During upshifts or downshifts the clutch brake is not required and will be subject to fast deterioration if used. To avoid engagement of the clutch brake do not "bottom" the clutch pedal during upshifts or downshifts; if it is depressed only to a point 1" (2.5 cm) above floor, a smooth shift will be possible without excessive wear to clutch brake.

Reverse Shifting (4-Speed)

The "MASTER" switch must be in the "ON" position before "REVERSE" switch will be operative.

To shift into reverse gear stop coach completely. Depress clutch pedal and, while holding the "REVERSE" switch in the "ON" position move shift lever into second gear position from neutral.

To shift out of reverse gear stop coach completely. With clutch pedal depressed, move gear shift lever into the neutral position. It is not necessary to use the "Reverse" switch when shifting out of reverse.

CAUTION:

Reverse Switch should be used only when gear shift lever is in neutral position, otherwise possible locking of gears may result.

Reverse Shifting (5-Speed)

On 5-speed transmissions a reverse solenoid is not used and the shift to reverse can be made in the same way as the other gears.

Up Shifting

Always start the coach in motion in first gear, then change progressively into, second, third, etc. Do not skip gears. Double clutching is recommended when making each gear change. Remain in each transmission speed until the engine reaches full governed speed before shifting into the next higher gear.

5-Speed Manual Transmission Shift Points with 8V-71 Engine-2100 R.P.M. and 3.73 Rear Axle.

Gear Shift	1-2	2-3	3-4	4-5	Top Speed
Veh. Speed (MPH)	12.7	21.5	34.0	53.1	69.6
(kmh)	20.4	34.6	54.7	85.5	112

FIG. 36

Down Shifting

Double-clutching in downshifting is recommended. Always change to a lower gear to avoid engine "lug". Lower gears should be used in driving up or down grades, when operating on ice, snow or mud.

Lower gears should be used when going down grade in order to make use of the engine as a brake in controlling vehicle speed. The same transmission gear should be used to go down a grade as would be used in climbing it. However, the engine should never be allowed to operate at a speed higher than the maximum governed speed.

Use of Transmission (Opt. Automatic)

CAUTION:

When parking vehicle, gearshift should always be left in "NEUTRAL POSITION."

The operation and driving of the MC-9 coach with an automatic transmission is similar to that of a normal automobile automatic transmission. In order to attain better vehicle performance proper ranges should be selected for speeds to be driven depending on driving conditions. On 4-speed transmissions each forward range starts in 1st gear; on 5-speed transmissions the forward range starts in 2nd gear and will only shift down to 1st if 1st gear is selected with the range selector lever. Upshifts occur automatically through the gear range selected.

Automatic transmission range selector levers are equipped with a pull-up release mechanism. On 4-speed transmissions the pull-up release must be used to shift in or out of neutral and reverse or for downshifts from 3rd through 1st gear. On 5-speed transmissions the pull-up release must be used to shift in or out of neutral and reverse or for any downshifts.

N - NEUTRAL RANGE is used when starting the engine. Use the position and apply the parking brake whenever vehicle is parked.

CAUTION:

When shifting from neutral to a drive range, the engine should be at idle speed.

D - FOURTH RANGE is used for normal driving conditions. Upshifting and downshifting is automatic, depending on speed and load.

3 - THIRD RANGE is used when traffic conditions do not permit top speed. Upshifting and Downshifting is automatic.

2 - SECOND RANGE is used in congested traffic. Upshifting and down shifting is automatic. It can also be used effectively on downgrades to take advantage of engine braking.

1 - FIRST RANGE is used when starting the vehicle with an extra heavy load, pulling through mud and snow or driving up steep grades. It may also be used in very heavy or slow moving traffic.

R - REVERSE RANGE is used for backing the vehicle. The vehicle should be completely stopped before shifting from a forward range to reverse or vice versa. Reverse has only one gear position.

Back-Up Alarm

(Optional)

An audible back-up alarm is connected to the back-up light circuit. The alarm horn is mounted in the engine compartment and is activated automatically when reverse gear is selected.

Using Engine to Slow Vehicle

To use the engine as a braking force, shift to the next lower range. However, if the vehicle is exceeding the maximum speed of that lower range, use the service brakes to reduce speed before the downshift is made.

CAUTION:

PARKING BRAKE: There is no "park" position in the transmission shift pattern. Therefore, apply the parking brake to hold the vehicle when it is unattended. Be sure the selector lever is at neutral position.

FIG. 37

Cruise Control (Optional)

The cruise control is a driver operated, automatic speed control system that incorporates the following features:

1. Set/Resume - permits vehicle speed to be set or to resume at a previously set speed after disengagement.

2. Accelerate/Coast - permits vehicle speed increase or decrease with control switches.
3. Top speed, Set limit (earlier coaches only) prevents cruise control use above a preset maximum vehicle speed.

SETTING VEHICLE SPEED

To turn the system on, depress the "ON" side of the "OFF"/"ON" switch and a green indicator light will come on. Set the vehicle speed by accelerating the vehicle to the desired speed and momentarily depress and release the "SET" side of the SET/RESUME switch, then release accelerator pedal.

NOTE: Cruise Control System will not accept speed settings nor will the RESUME feature operate below approximately 20 m.p.h. (32 km/h).

WARNING:

Do not use the cruise control system when driving conditions do not permit maintaining a constant speed, such as heavy traffic or on roads that are winding, icy, snow covered, slippery, or with a loose driving surface.

INCREASING THE SET SPEED

Vehicle speed setting may be increased by one of two methods.

1. Depress and hold the "RESUME" of the SET/RESUME switch until the desired speed is obtained. Releasing the "RESUME" switch will set the new speed.
2. Depress accelerator pedal until desired speed is obtained then depress and release the "SET" switch.

NOTE: When driving with cruise control in use, the speed may be increased for passing, etc., by depressing the accelerator in the usual manner. Once the foot is removed from the accelerator pedal, the cruise control will return the vehicle to the "SET" speed.

DECREASING THE SET SPEED

Vehicle speed setting may be decreased by one of two methods.

1. Depress and hold the "SET" side of the SET/RESUME switch until the desired speed is obtained. Releasing the "SET" switch will set the new speed.
2. Lightly depress the brake to disengage the system. Allow the vehicle to coast to the desired speed then depress, and release the "SET" switch.

With Cruise Control in use, the standard transmission may be shifted in the normal procedure without manually disengaging the cruise control system. NOTE: The system will automatically adjust the engine r.p.m. allowing the shift to be completed and maintain the set speed at a new gear selection.

CANCELLING THE SET SPEED

The Cruise Control automatic operation may be cancelled by one of four methods.

1. Depress the "OFF" side of the "ON"/"OFF" switch.
2. Turn the "MASTER" switch to "OFF" position.
3. Make a slight brake application.
4. Vehicle speed drops 20 m.p.h. (32 km/h) below the "SET" speed.

NOTE: RESUME features may be used again when automatic operation is cancelled with steps 3 or 4. The "RESUME" feature will automatically return the vehicle speed to the setting prior to a brake application and maintain the set speed.

When the cruise control automatic operation is cancelled, any objectionable vehicle motion can be minimized by placing foot on accelerator before disengaging cruise control.

Automatic Transmission Oil Level Check

Transmission oil level should be checked at regular service intervals by maintenance personnel.

Oil Specifications

Only Dexron® or Dexron II® automatic transmission fluid is recommended.

CAUTION:

INDICATIONS OF ABNORMAL CONDITIONS: Any indication of abnormal conditions should immediately be brought to the attention of maintenance personnel. The transmission should not be operated when it is overheated, when clutches are slipping or when noises indicate damage.

Towing

If it is necessary to tow coach, only a solid link tow bar and safety chain must be used.

CAUTION:

Do not lift coach. Lifting by means other than shop facilities can readily result in exterior body damage.

On either automatic or manual transmission the drive axle shafts must be removed when being towed to avoid possibility of damage to transmission.

Remove stud nuts and washers retaining axle shafts, rap center of axle shaft flange sharply to loosen dowels and pull out axle shaft. Plug axle tube to prevent oil loss.

Battery Disconnect

A main battery disconnect switch, located in the battery compartment, is provided to shut off all electrical supply from the batteries. To disconnect batteries, pull knob to "OFF" position.

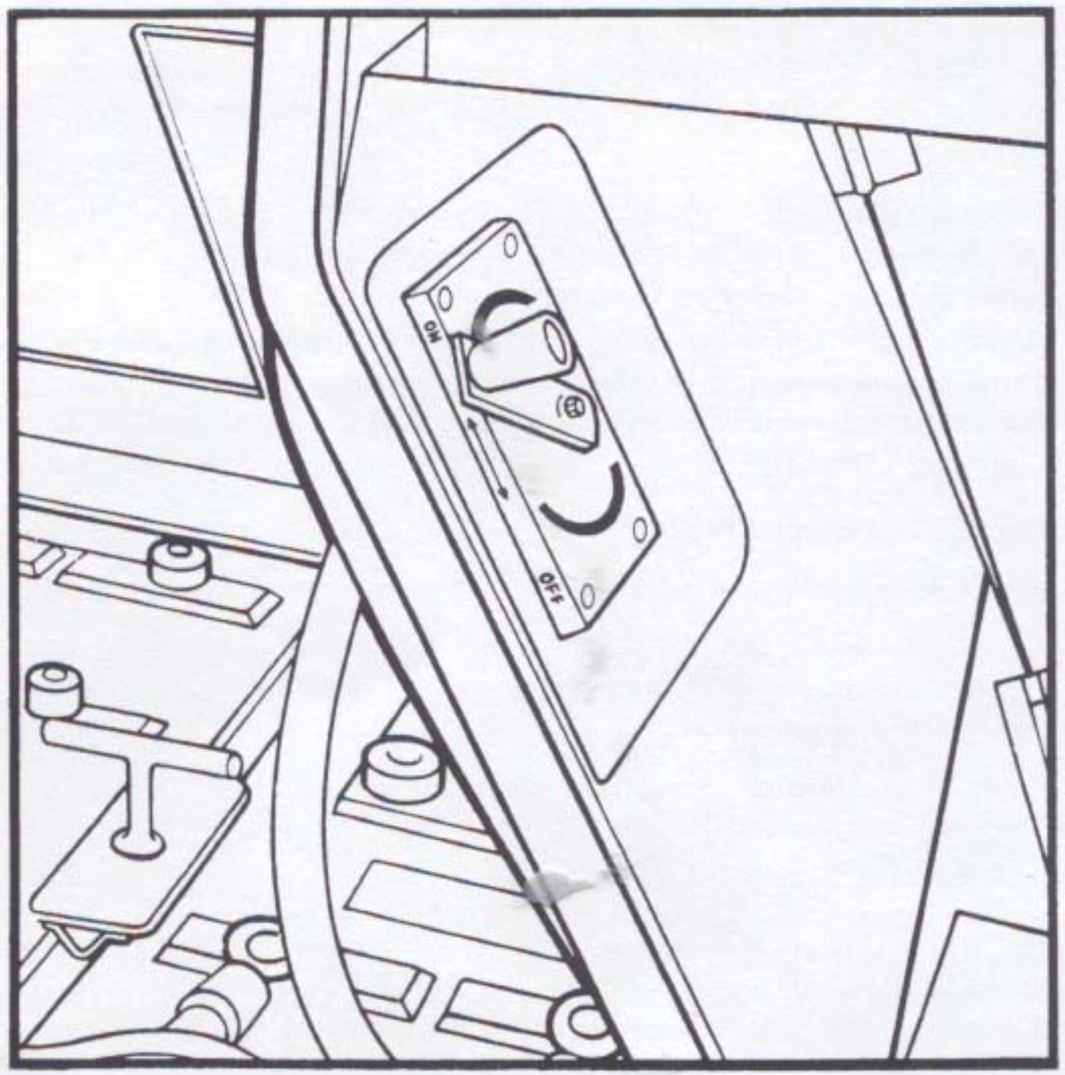


FIG. 38

Circuit Breakers

All electrical circuits are protected by circuit breakers. The main circuit breaker is automatic and the two large circuit breakers protecting the air conditioning condenser blower motor and heating system blower motor are located at the front of the baggage compartment and can be reached through the left front baggage door.

The two motor ciruit breakers must be manually reset, if they open, by pressing the button.

Smaller circuit breakers of the self-resetting type are located in the junction panel to the left of the operator's compartment. When one of these circuit breakers opens due to a shorted circuit, it will automatically reset itself when the breaker element cools. As long as the short exists, the breaker will continue to open and close intermittently. In this case turn the defective circuit off, until the cause can be located and corrected.

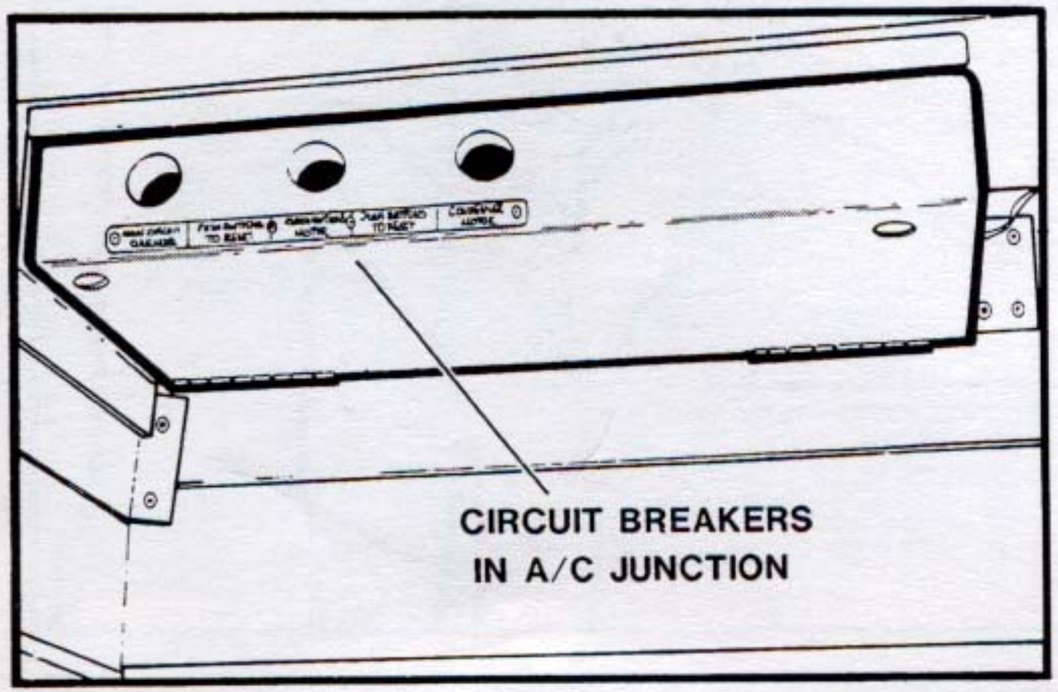


FIG. 39

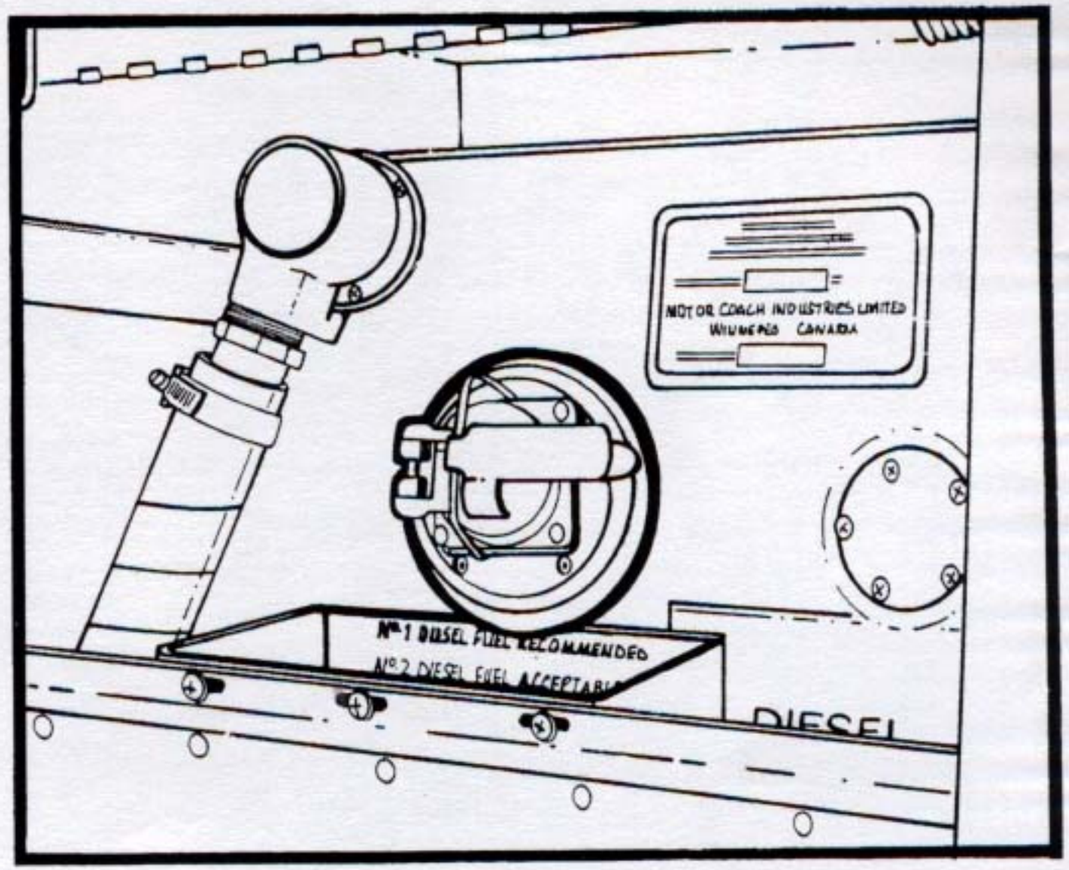


FIG. 40

Engine Fuel Oil

The engine fuel oil tank is accessible through an access door at right side of coach.

The fuel tank is equipped with a device which whistles while tank is being filled and stops when tank is full. Use only clean diesel fuel of the correct grade. Close fuel tank filler cap and tighten securely after filling.

Oil Levels

Engine oil dipstick is accessible through the rear engine service door. Oil filler pipe is at left hand side of coach on engine (natural), or on right side of coach with turbo engine.

Always check engine oil level with engine at normal operating temperature and with the coach in a level position.

CAUTION:

Leave engine stopped for at least five minutes before checking oil level.

To open rear engine service door, turn handle counterclockwise; clockwise to close.

Withdraw the dipstick and wipe clean. Insert dipstick, then withdraw and note oil level. If down to "LOW" mark, sufficient oil must be added to bring level up to "FULL" mark. Add crankcase oil of proper grade and viscosity.

Sight gauges are provided for checking the oil level in the engine cooling blower gear box and the power steering fluid reservoir. Correct level is maintained when oil is at the center of the glass. Levels should be checked periodically and fluid added if necessary.

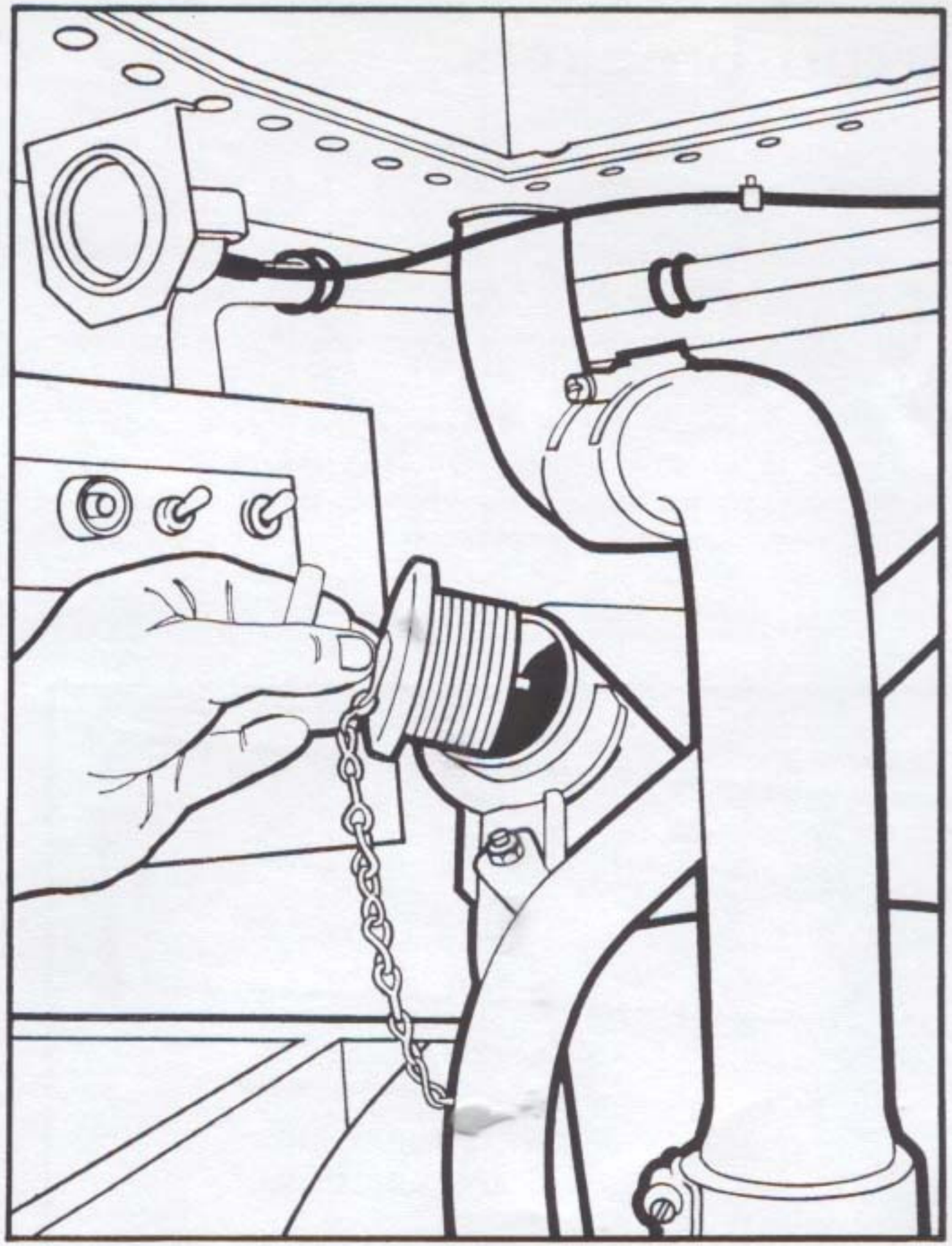


FIG. 41

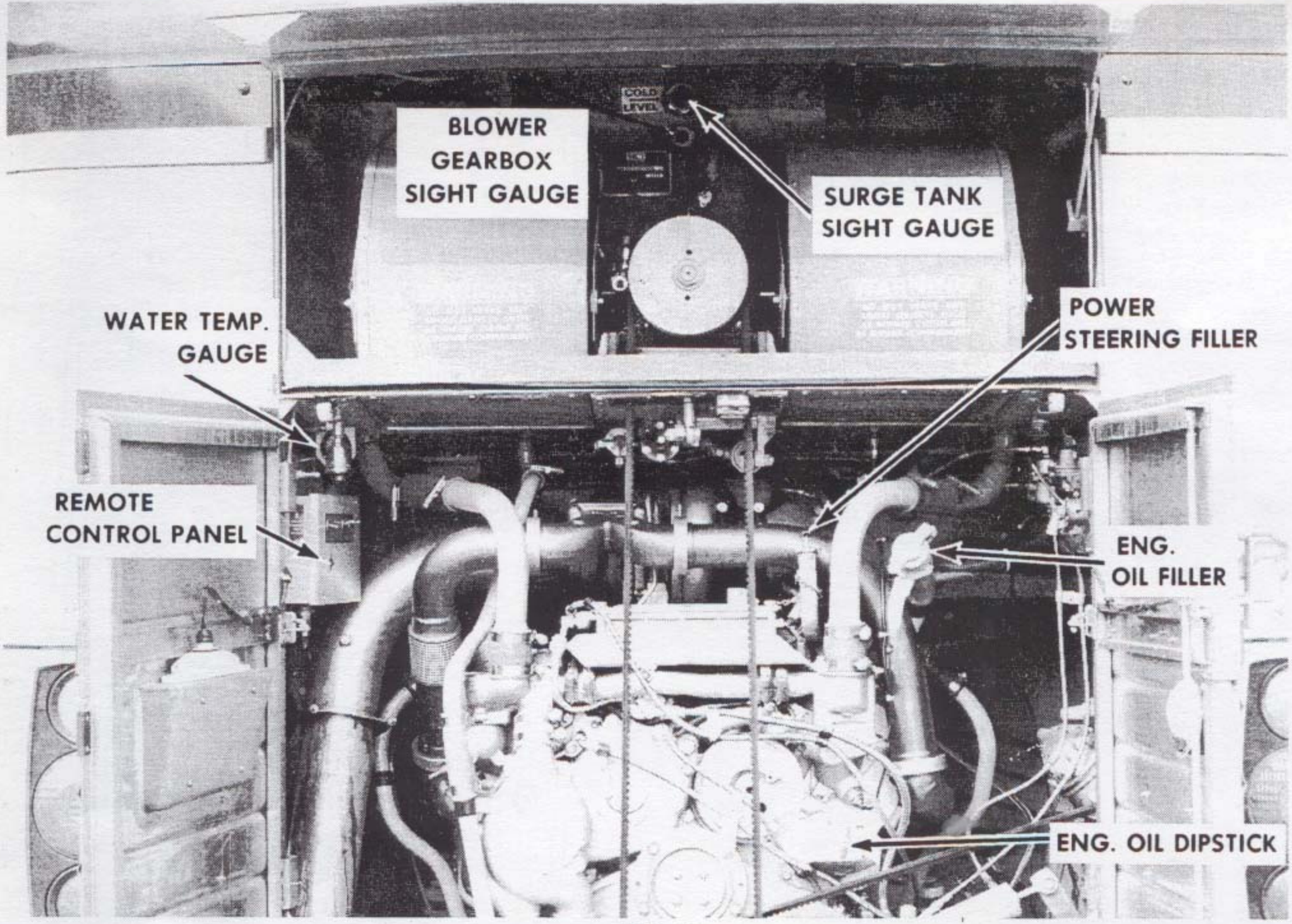

BLOWER
GEARBOX
SIGHT GAUGE
SURGE TANK
SIGHT GAUGE
WATER TEMP.
GAUGE
POWER
STEERING FILLER
REMOTE
CONTROL PANEL
ENG.
OIL FILLER
ENG. OIL DIPSTICK

FIG. 42

Engine Cooling System

CAUTION:

The Heating and Engine Cooling System cannot be completely drained and therefore when replenishing the system a proper mixture of antifreeze and water must be installed to prevent any possible damage to system due to freezing conditions. The coolant capacity is shown under "GENERAL DATA" at the end of the manual.

The engine cooling system controls the operating temperature of the coach engine and also provides a supply of heated water for the coach heating system.

The filler cap is located on the right hand side of the coach at the rear above radiator compartment.

A sight gauge located on the rear face of the surge tank shows coolant level. Correct level is approximately half way in sight glass.

To add water and/or antifreeze, open the radiator filler door, depress the vent button at the lower inside of fill box to relieve pressure, if any and open fill cap. Fill coolant to the required level.

Two gate valves are located in heater lines to separate the heating system from the engine cooling system. This feature is provided for emergency and maintenance purposes.

CAUTION:

Cold water and/or antifreeze should never be poured into the cooling system when engine is hot. Wait until engine has cooled, then add water and/or antifreeze slowly with engine running.

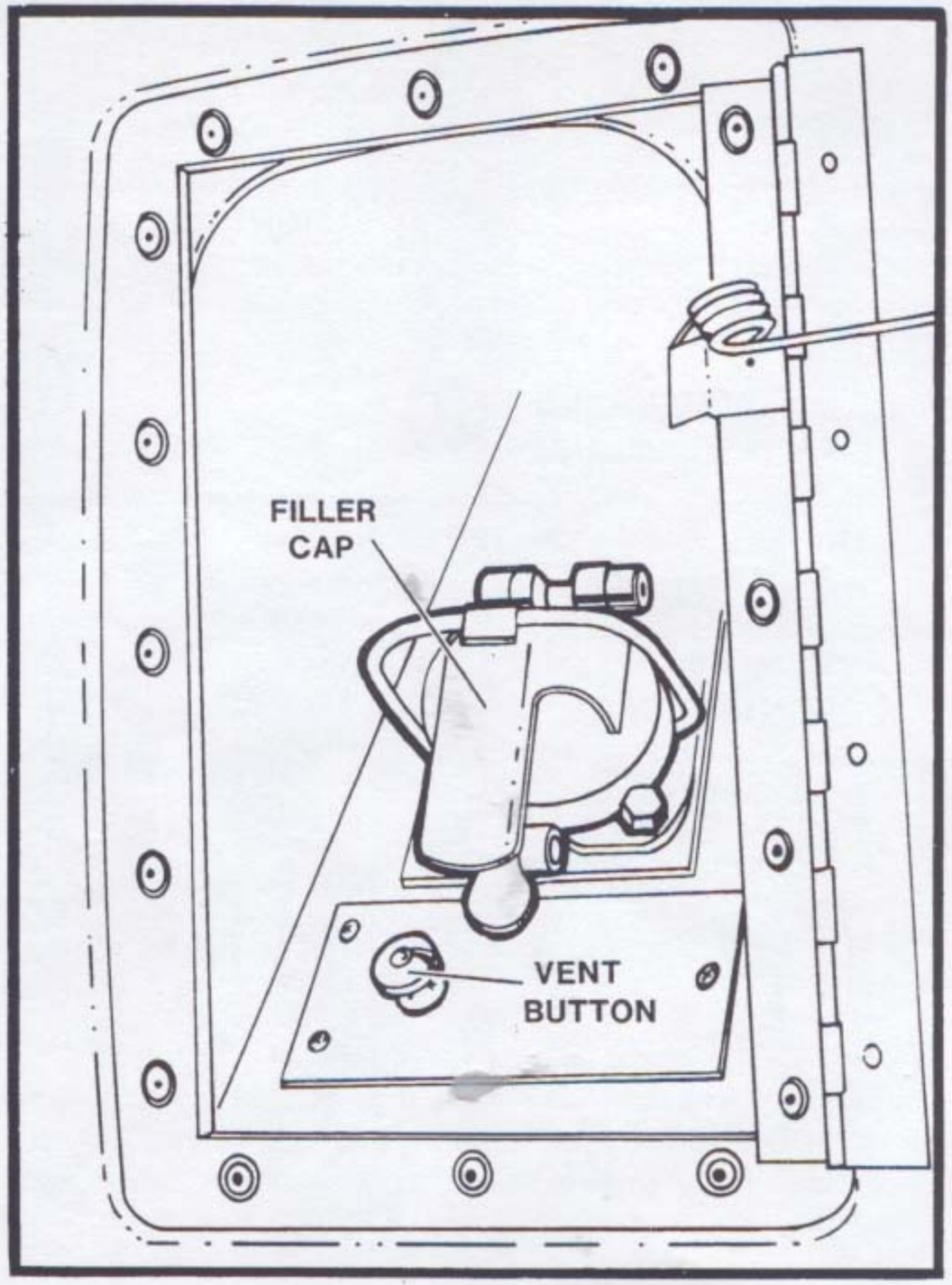


FIG. 43

Engine Immersion Heater

(Optional)

Some coaches are also equipped with an electric engine immersion heater to assist in cold weather operations. The immersion heater may be equipped with a cord and a plug in the engine compartment or an optional receptacle to the right of the rear engine service door. The engine heater should be used whenever the coach is parked for an extended period in cold weather and a suitable power source is available.

CAUTION:

Only 110 volt AC power should be used, and the power cable must be grounded (three prong) type.

Make sure power cable is disconnected before moving coach.

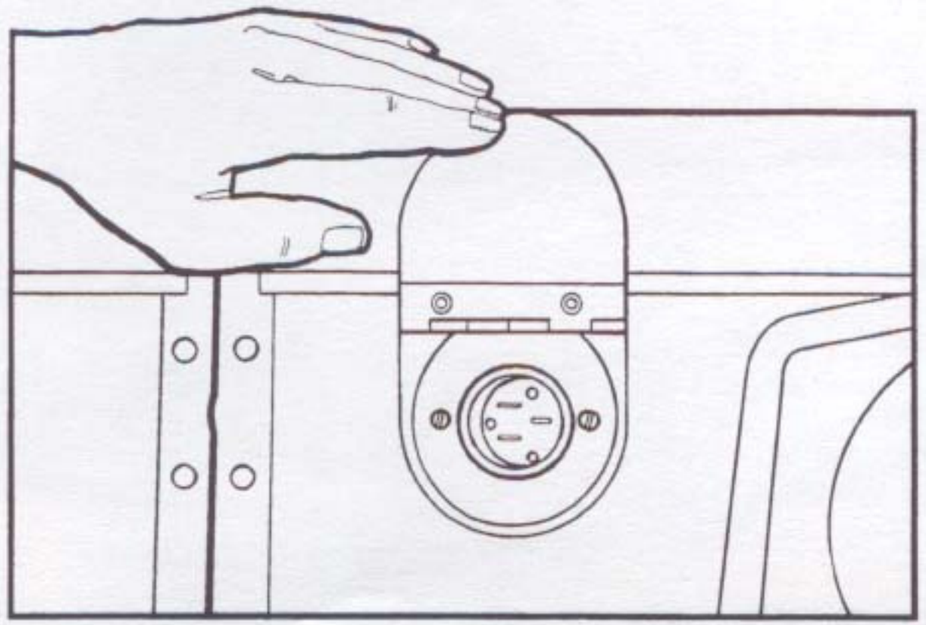


FIG. 44

Exterior Compartments

Exterior views on following page identify all exterior compartments and access doors. Method of opening and function of main compartment doors are as follows:

Condenser Door

Condenser door is located at left side of coach giving access to air conditioning condenser blowers and other components for service purposes only. It is fastened by four slot-type fasteners and is held in the open position by a hinged metal strap. Break lock on strap before closing door.

Battery Compartment

The battery compartment is located on the right-hand side of coach. Access is through a separate compartment door located behind the front wheelhousing. The door is secured by a spring type lock. It is held open by a pin locking device.

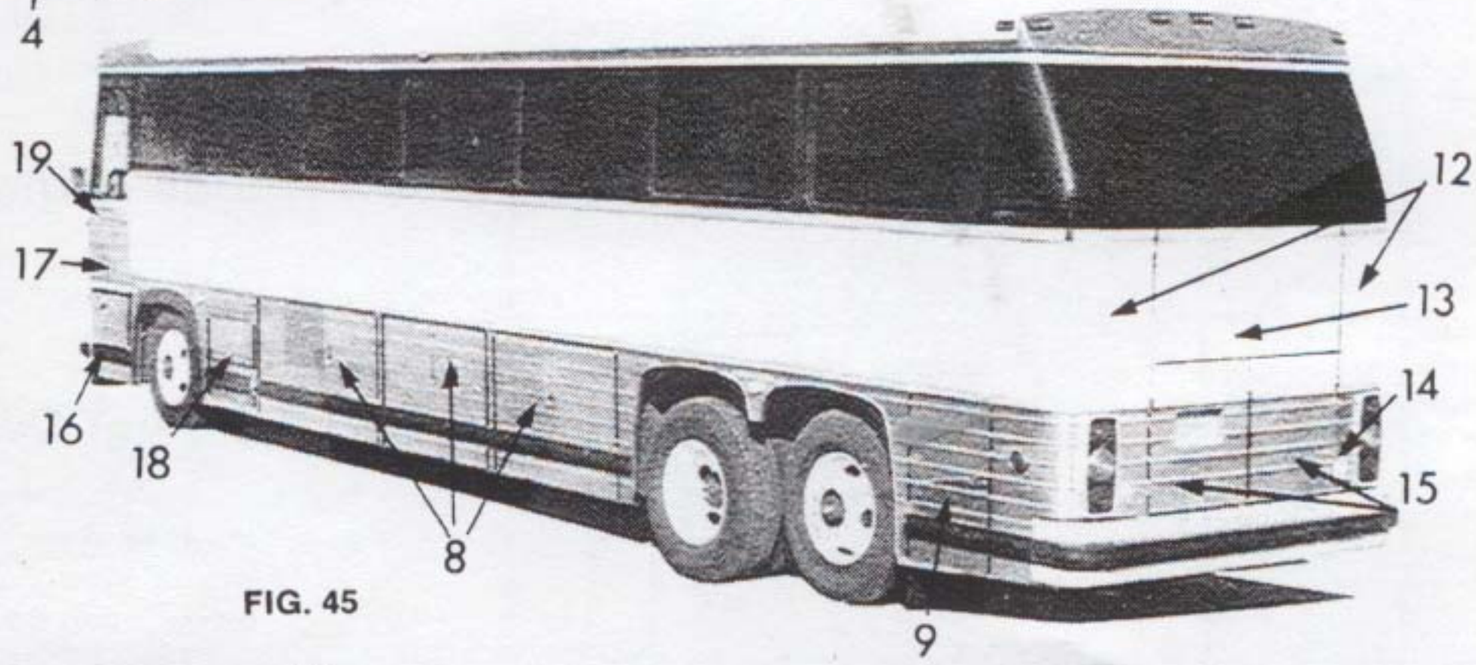
Side Engine Compartment

Access to sides of engine is provided by doors at the left and right rear sides of coach. Turn handle counterclockwise to open and clockwise to close doors.

Blower Door

Engine cooling blower compartment is accessible through a door provided above the rear engine service doors. To open, first open rear engine doors, pull down on two spring-type catches at bottom edge of blower door. Pull door out and up and engage prop rod.

1. Entrance door release knob
2. Front license plate location
3. Bumper and spare tire compartment door
4. Entrance door
5. Entrance door pull handle
6. Fuel tank filler door
7. Battery compartment door
8. Baggage compartment doors
9. Side engine compartment service doors
10. Lavatory service panel door (Opt. Equip.)
11. Cooling system filler door



12. Radiator compartment doors
13. Blower compartment door
14. Immersion heater plug (Opt. Equip.)
15. Rear engine compartment service doors
16. Left front side compartment door
17. In-Station lighting plug door 110V (Opt. Equip.)
18. Condenser door
19. Electrical panel door

FIG. 45

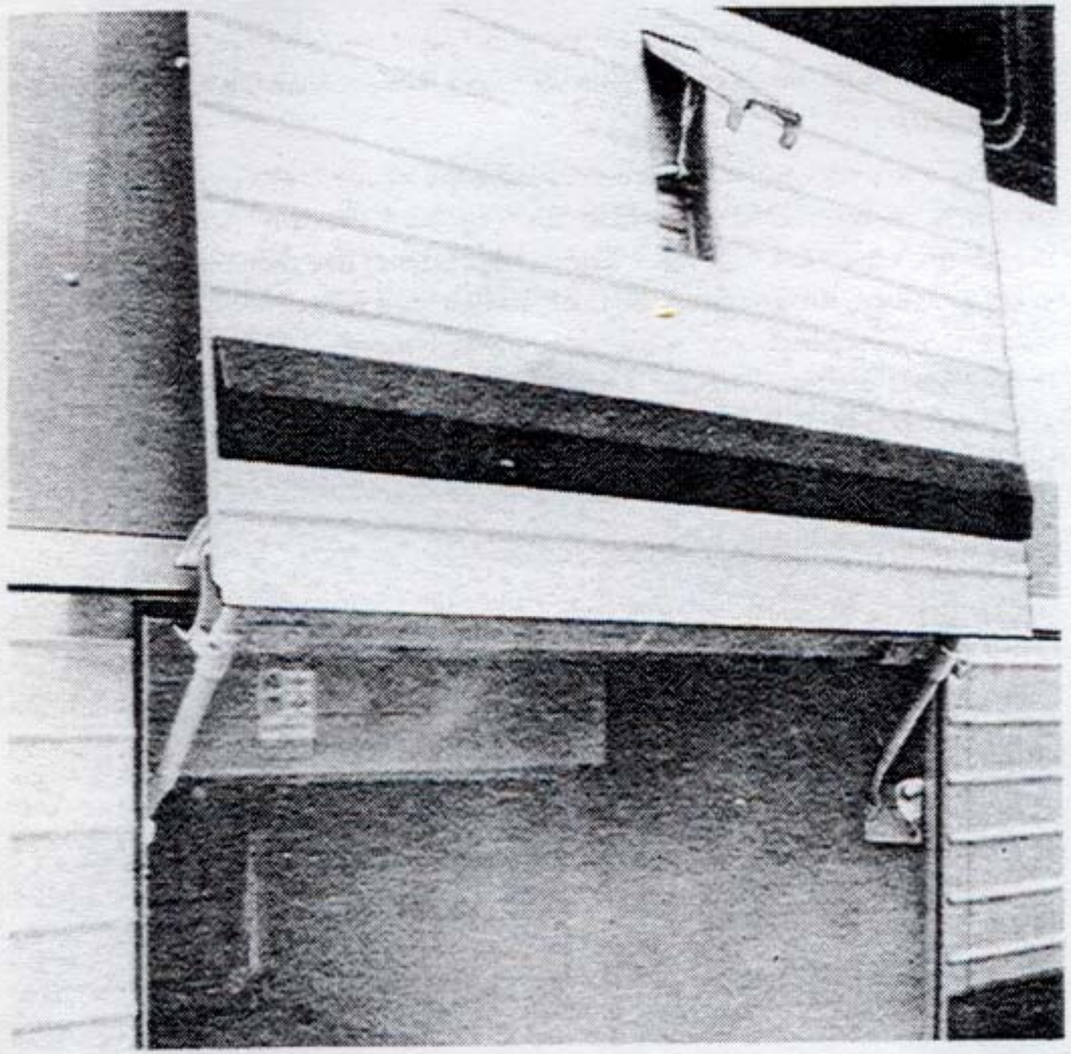


FIG. 46

CAUTION:

Checks should be made at regular intervals to be certain that blower compartment door is closed securely. Serious loss of engine cooling capacity may result if the door is not properly latched.

Baggage Compartment

Insert fingers under latch handle, then pull out and up on handle to release latch. To lock, lift up on door latch, push door closed, and push latch down until it snaps into the closed position.

Air Operated Baggage Door Locking System (Optional)

An air operated baggage door locking system locks all six (6) baggage doors automatically with release of the parking brake.

To disengage the baggage door locking system, the parking brake must be applied, then a control button, located on the right hand portion of the dash directly above the entrance door air lock overrule valve, must be depressed. When the parking brake is applied and the coach air system drops to approximately 60 PSI, the air operated baggage doors will lock and can only be released when the coach air pressure is returned to normal.

Separate restrictions are installed in air lines on each side of coach to allow opening of baggage doors on one side of coach in case of air line leakage on other side. In the event of total air loss to both air lines, an emergency air fill provision is located in L.H. front service compartment to permit operation of air cylinders to open baggage doors.

Lavatory (Optional)

Lavatory compartment, located at right rear of coach, contains a chemical toilet, wosh basin with running water, waste paper container and mirror.

Lavatory compartment ventilation blower runs whenever "MASTER" switch is in the "ON" position. Closing and locking door from inside illuminates the "OCCUPIED" sign on outside of the door and illuminates ceiling lamp. Emergency buzzer switch provided with the Lavatory option is located on wall of compartment with clearly marked instruction plates. When emergency buzzer switch is depressed, lavatory tell-tale lamp on instrument panel illuminates and buzzer sounds.

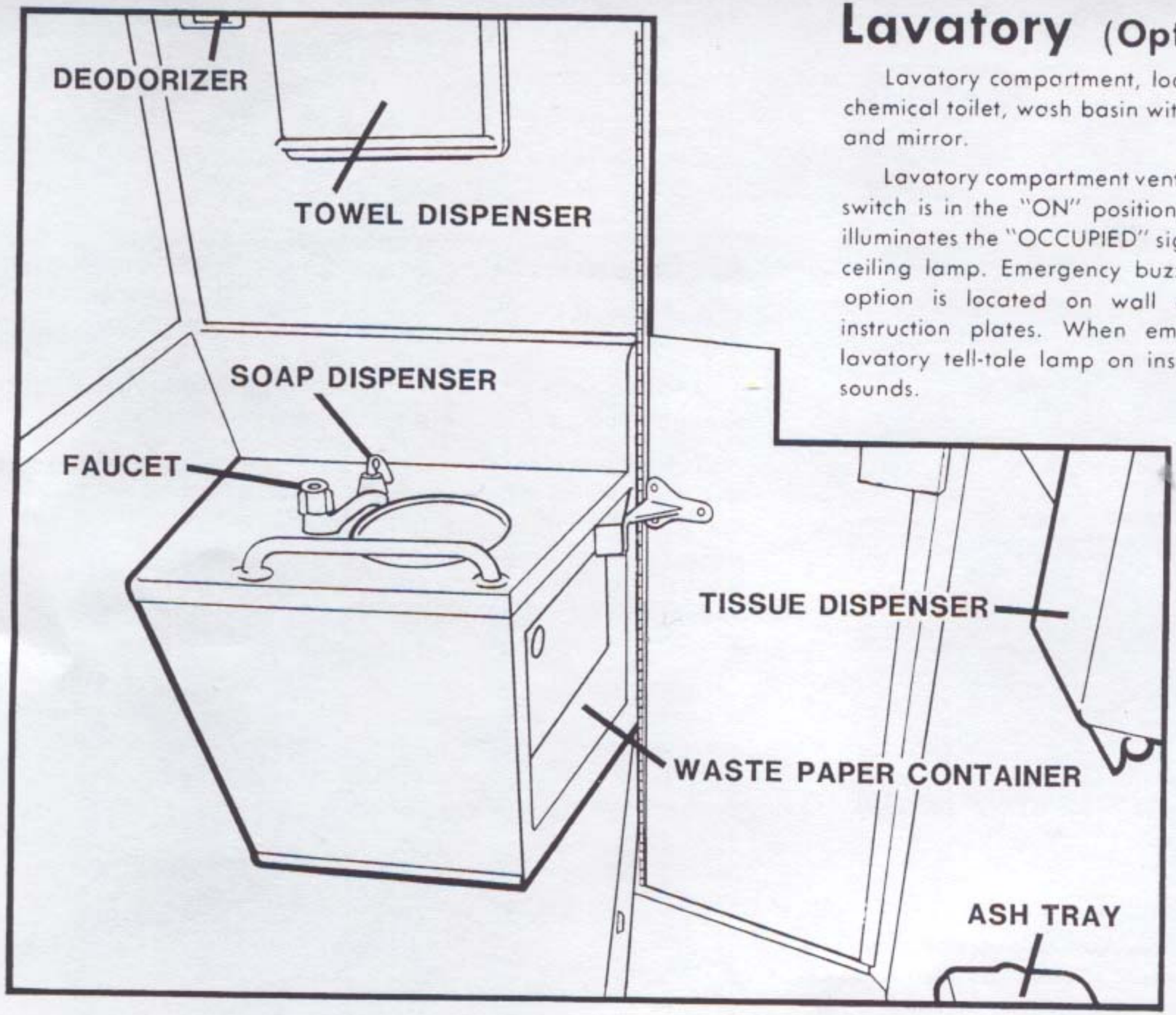


FIG. 47

Lavatory Auxiliary Retention Tank (Optional)

The lavatory main tank may be drained into the auxiliary tank (if so equipped) by opening the manual slide valve between the two tanks. This will permit continued operation of lavatory until coach can be serviced at a facility with disposal provisions.

Draining

In the event of engine or heating system failure in freezing weather, tanks must be drained to prevent damage from freezing. Valve necessary to drain tank is located in the rear engine compartment and is accessible when rear service doors are opened.

IMPORTANT

Servicing lavatory tanks must normally be accomplished where proper facilities are available. Draining instructions included in this book are for use only in case of an emergency requiring draining of tanks.

Before draining a chemical waste tank, position coach over a receptacle or sewer inlet or other facilities to comply with local health regulations.

SLIDE VALVE TYPE: Pull handle of slide valve located on dump tube in right side of engine compartment.

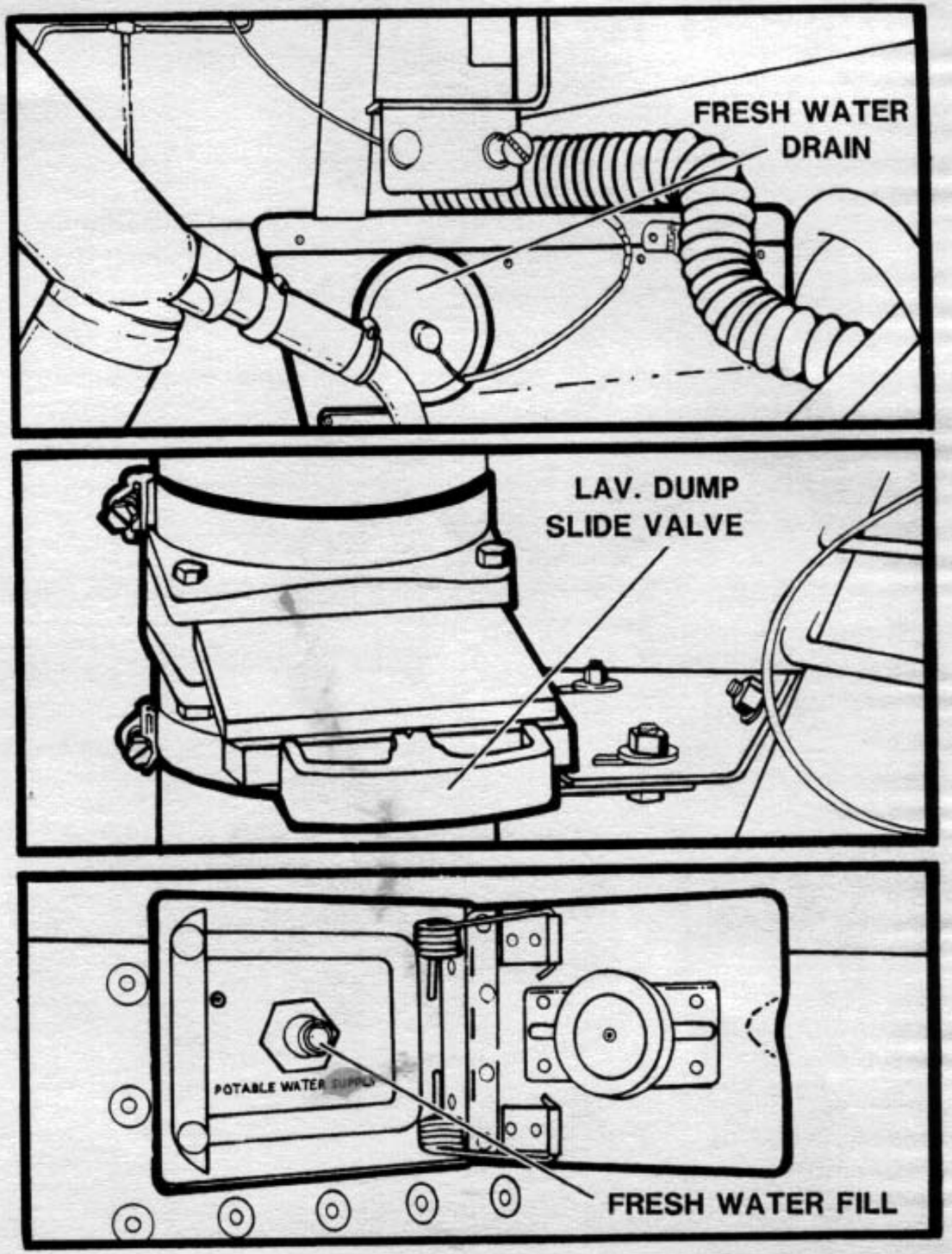


FIG. 48

Spare Wheel & Tire

Spare wheel and tire are carried in a compartment immediately behind the front bumper. Access is gained by releasing retaining locks located directly beneath the bumper, then pulling bumper out and up. Bumper will lock in the open position.

Make sure that both bumper locks are firmly in place after closing compartment door.

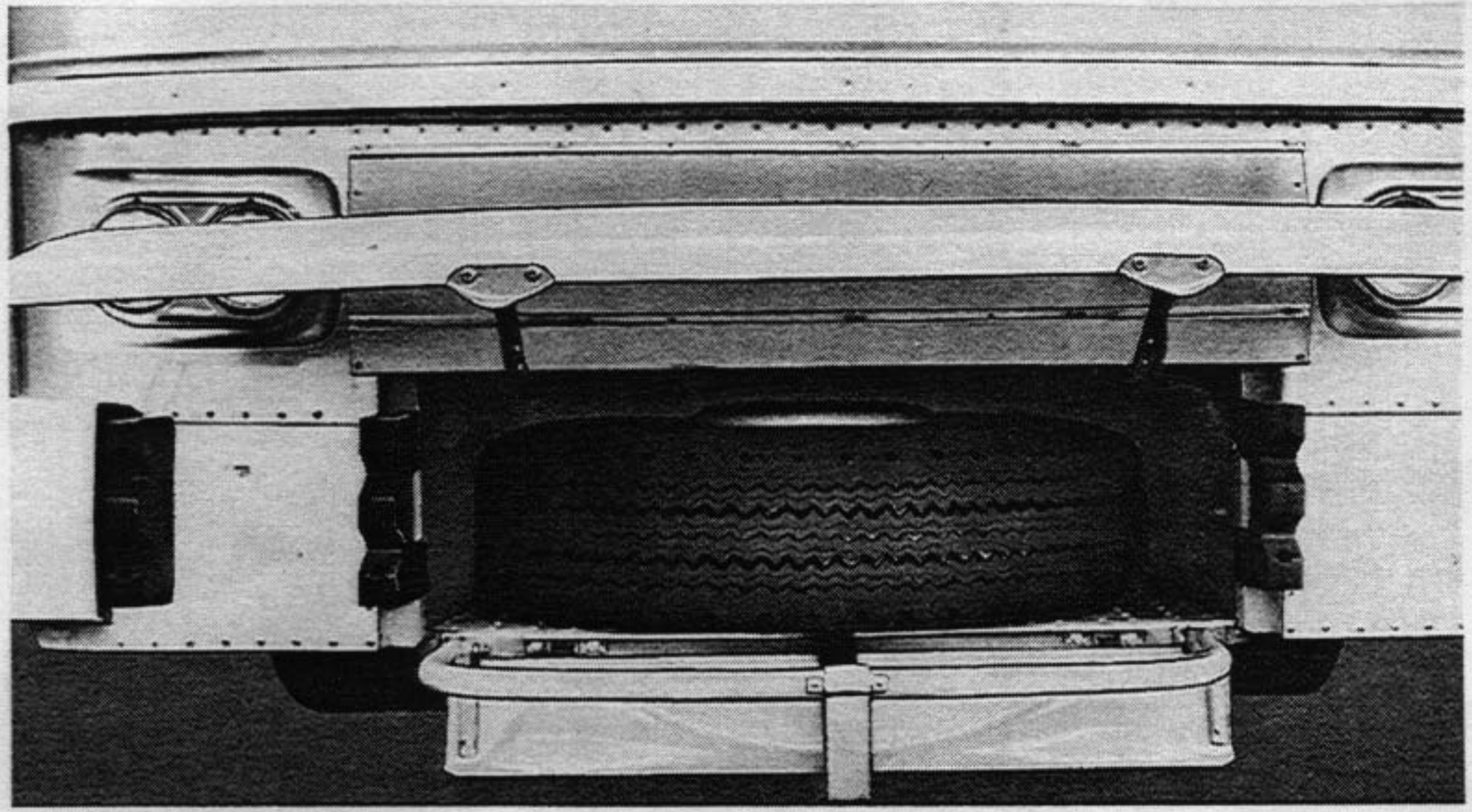


FIG. 49

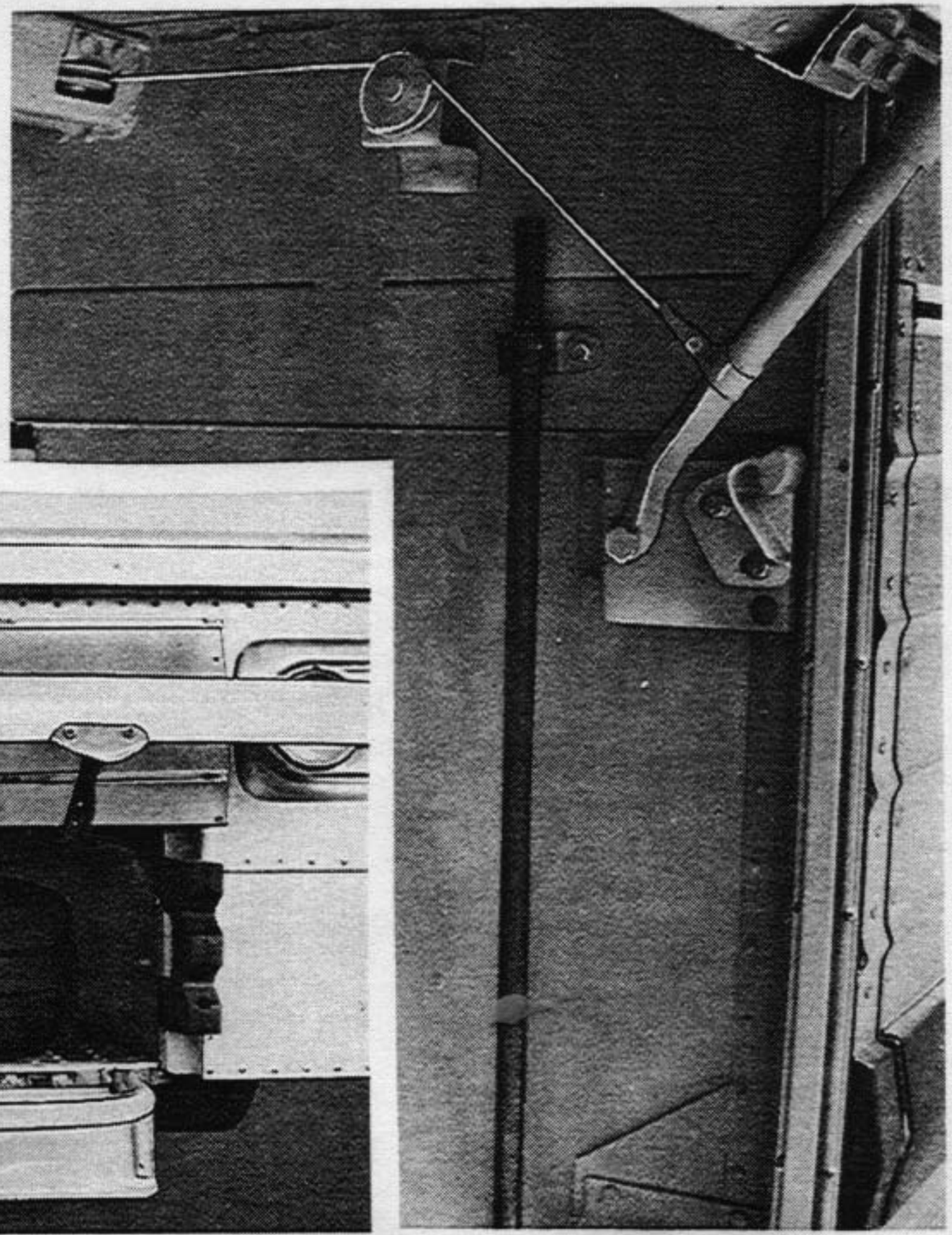


FIG. 50

Changing Wheels

Use of Run-Up Block and Jack

TO CHANGE FRONT WHEEL: Place the wooden run-up block in front of the deflated tire and drive coach onto the block. Apply parking brakes. Position jack under front jack pad and jack up coach. Remove run-up block and change wheel.

TO CHANGE OUTSIDE DUAL: Place wooden run-up block in front of the inside dual. Drive coach onto run-up block. Apply parking brakes then change wheel.

TO CHANGE INSIDE DUAL: Apply parking brakes position jack under the rear jack pad. Jack up axle and change wheel.

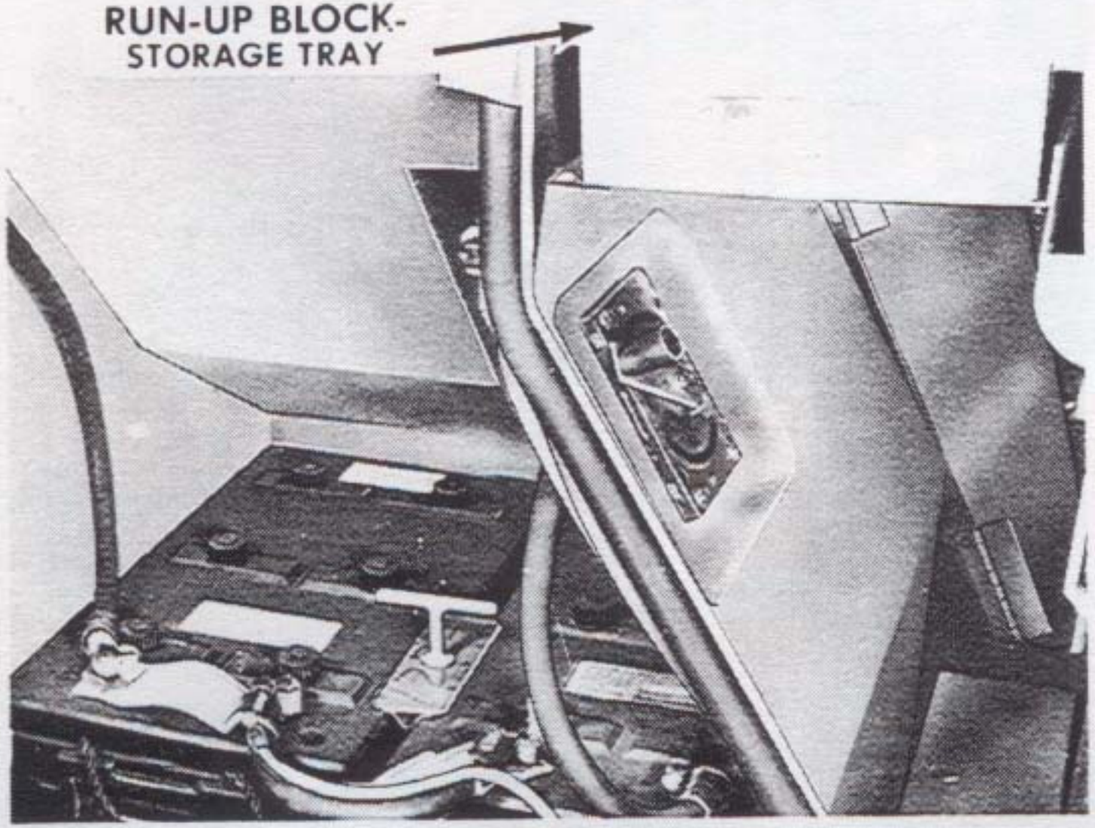


FIG. 51

FIG. 52

FIG. 53

Rear Trailing Wheels

In case of a flat tire at this location, release air pressure from bellows by turning the air release valve to the off (lever in horizontal position) until air is released from bellows. Jack up trailing wheel and change wheel using spare wheel in the tire compartment.

IMPORTANT

Raising a deflated rear trailing wheel is an emergency measure only to enable the vehicle to reach a service point. The tire should be raised and hold-up link installed to hold wheel off ground level. The flat tire should be repaired or replaced as soon as possible to permit normal operation. Reduce road speed to minimum when it is necessary to operate the coach with trailing wheel in raised position. NOTE It is recommended that the flat tire be removed and hold-up link placed in position and the bellows air release valve be left in "ON" position.

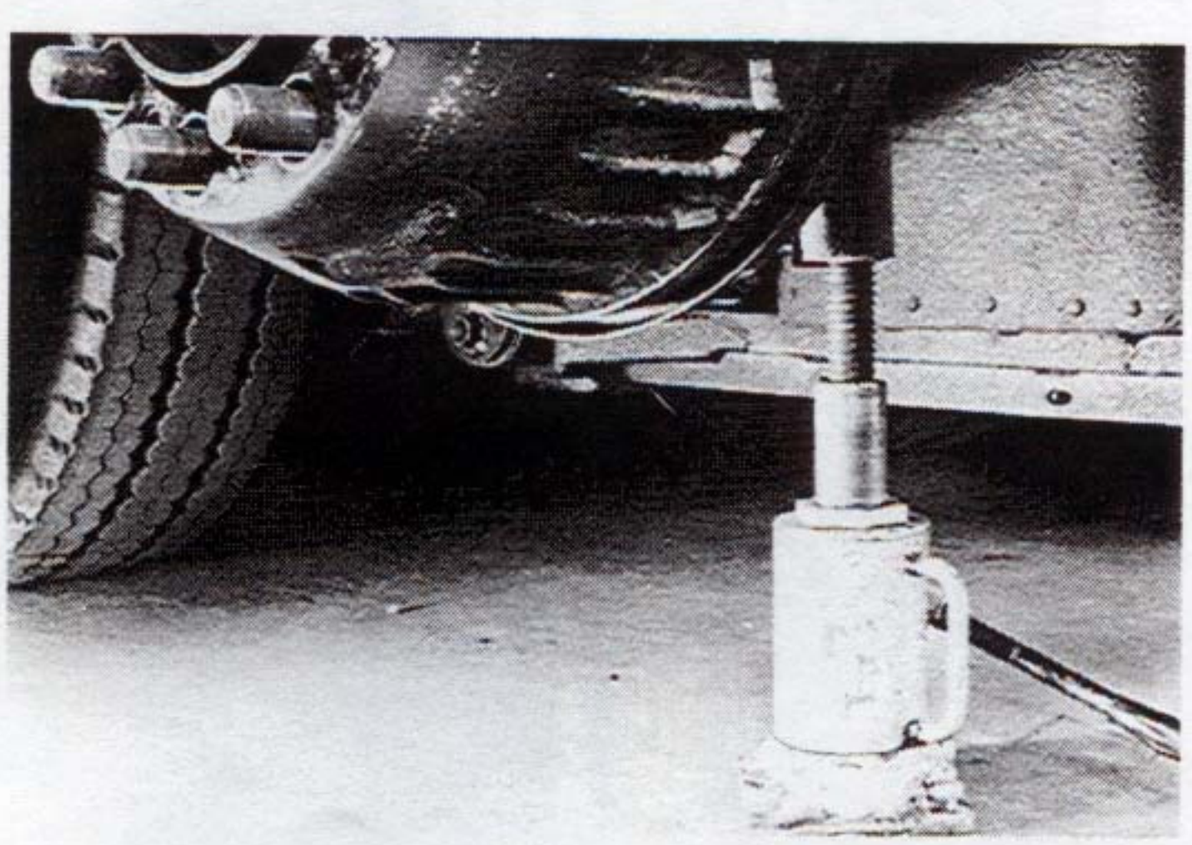


FIG. 54

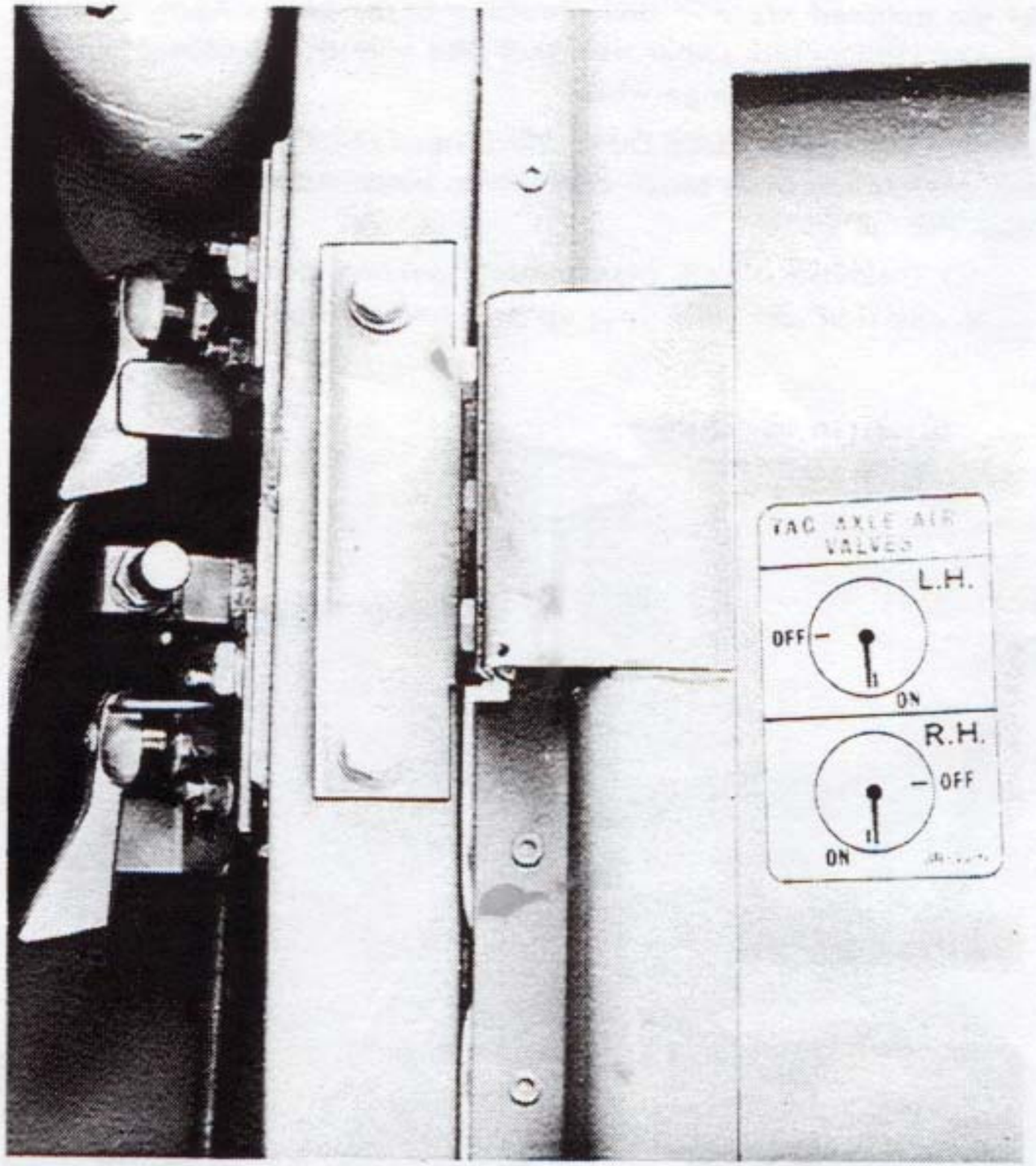


Fig 55

Mini Galley (Optional)

The Mini Galley is located at the center rear of the coach and includes the following components; a compact refrigerator, hot and/or cold beverage containers and storage cabinet.

OPERATING INSTRUCTIONS

1. Set thermostat knob, inside refrigerator, to desired temperature min. +1 (48°F/9°C) or Max. +5 (32°F/0°C). Make sure Red reset button is latched "IN".

2. With engine running, "NO GEN." T/T light "OFF" and Mini Galley control switch "ON" at Driver's switch panel, place refrigerator 24V switch to "ON". Amber power light will come on.

3. After 20 min. of operation, check interior of refrigerator for a noticeable temperature drop. Refrigerator should drop to cold operating temperature in 1 hour.

NOTE: If temp. drop is not evident by cooling of the freezer plate, refer to the troubleshooting guide on MCI/TMC wiring diagram - Mini Galley (7G-13-231).

4. For 110V AC power operation: plug in 3 prong grounded plug power cord into receptacle provided on the outside left rear of the coach (110V 60 Hz only). Select 110V AC refrigerator operation on the control panel at the front of the mini galley.

5. Hot beverage dispensers will automatically shift from 24V DC to 110V AC. Amber lights will now be "ON" for refrigerator and warmers.

6. Hostess light will not operate on 110V AC (Note Step 2, Operation only).

7. When not in use, the refrigerator should be emptied, cleaned, dried and the door left ajar.

General Data

VEHICLE HEIGHT (MAXIMUM) ..... 133 inches (3,378 mm)
VEHICLE WIDTH (MAXIMUM) ..... 96 inches (2,440 mm)
TIRE SIZE (TUBE TYPE) ..... 11.5 x 20
11.00 x 20
TIRE SIZE (TUBELESS) ..... 12.5 x 22.5
12.00 x 22.5
12.75 x 22.5
†FUEL TANK CAPACITY ..... 144 Gal. U.S.
120 Gal. Imp.
545L
FUEL TYPE ..... ASTM No. D975
No. 1D Recommended; No. 2D Acceptable
*ENGINE CRANKCASE CAPACITY ..... 28 Qts. U.S.
Engine Oil SAE 30, 40 26.5L
HYDRAULIC SYSTEM CAPACITY ..... 7.5 Qts. U.S.
(Power Steering) 7.125L
(Warm oil level halfway in sight gauge after system is bled)
(Engine Oil SAE 10W40 MS or DS Service)
**STANDARD TRANSMISSION CAPACITY (4-spd.) ..... 10 Qts. U.S
(Engine Oil SAE 30 H.D. DS) 9.5L
**STANDARD TRANSMISSION CAPACITY (5-spd.) 22 Pts. U.S.
(Engine Oil SAE 40 or 50 DS) 10.4L
REAR AXLE LUBE CAPACITY ..... 18 Qts. U.S.
(Incl. hub cavities; SAE 90-cold weather 17.1L
and SAE 140-warm weather)
COOLING SYSTEM CAPACITY (Standard) ..... 23.0 Gals. U.S.
87.1L
COOLING SYSTEM CAPACITY (w/Large Radiator) ... 24.5 Gals. U.S.
92.8L

*When filling or adding oil, fill to "FULL" mark on dipstick after running engine. The capacity applies to completely empty system including oil filters.

**Fill or add to "FULL" mark on dipstick.

†Fill rate must not exceed 95% of these capacities or see nameplate for fill rate capacities on top of the driver's switch panel and on face of fuel tank.

Light Bulb Data

When replacing bulbs, special attention must be paid to the voltage rating. All bulbs in the coach are 28 volt with the exception of optional in-station ceiling, destination sign, and baggage lamps, and headlamps.

EXTERIOR LAMPS	NUMBER	C.P.	QTY.
*Fog lamps			
(Sealed Beam	4880		2
Headlamps - Inner	4619 (24V)		2
Headlamps - Inner	4001 (12V)		2
Headlamps - Outer	4624 (24V)		2
Headlamps - Outer	4040 (12V)		2
Turn Signal Lamps	1638	32	4
Side Turn Signal Lamps (Front Side)	1638	32	2
Stop Lamps	1683	32	2
Destination Sign Lamps	1691 IF	15	5
Tail Lamps	1252	3	2
Rear License Plate Lamps	624	6	1
Center Identification Lamps	624	6	6
Ext. Step Lamp	624	6	1

EXTERIOR LAMPS (Cont'd)

	NUMBER	C.P.	QTY.
Ext. Step Lamp	624	6	1
Roof Corner Clearance Lamps	624	6	4
Side Marker Lamps	624	6	4
Back-Up Lamps	1638	32	2
Intermediate Side Marker Lamps	624	6	2

INTERIOR LAMPS

	NUMBER	COLOR CAP.	QTY.
*Lavatory Main Lamp	1638		1
*Lavatory Night Lamp	1495		1
Reading Lamps	1691 IF		44
Driver's Lamps	1203		1
Indirect Lamps	1495@		54
Aisle Lamps	1251	Blue	6
Instrument Panel Lamps	265	Green	3
Switch Illumination Lamps	265	Green	10-11
Speedometer Lamp	356		1
Air Gauge	456		1
*Tachograph Lamps (Sangamo)	193		2
*Tachograph Lamps (ARGO)	15617		2
Step Lamp	624		1
Baggage Compt. Lamps	308 IF		6
Engine Compt. Lamps	456		4
Running Lamps	1495@	Blue	4
*In-Station 115V — Ceiling— Fluorescent	F15T8		22
*In-Station 115V —Baggage—	15T7 DC/IF		6
*In-Station 115V —Destination—	15T7 DC/IF		4

@ changed to #623 at Unit No. 35635

Heat On	265	Green	1
Air Conditioning	456	Red	1
Low Oil	456	Red	1
Not Generating	265	Amber	1
Emergency Brake	456	Green	1
*Lavatory Emergency	265	Red	1
Low Air	456	Red	1
Hot Engine	456	Red	1
Back-Up Lamps	456	Green	1
High Beam	265	Blue	1
Hazard Warning Flasher	265	Green	1
*Fog Lamp	265	Green	1
Stop Lamp	265	Green	1
Turn lamp	265	Green	1
Gen. Discharge - Remote Control panel	456		1
*Lavatory "Occupied" Sign	265		2
Trailing Axle	265	Red	1
*Low Water Level	265	Red	1
*Low Fuel Level	456	Amber	1
*Fire Alarm	265	Red	1
*Side Turn Lamps (Rear)	1638		2
*Auto Trans Illumination	265	Green	1

***Optional**

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